THE IRON TRADE REVIEW

Vol. LXVI Cleveland, January 8, 1920 *No. 2*

Makers Swamped With Orders

Order Books Filled in Some Lines Virtually to Jan. 1, 1921—Production is Being Apportioned Among Consumers—Railroad Buying Becomes Stronger—Pig Iron Production is Re-established on Pre-Strike Basis

A MORE complete casting up of obligations on mill books at the beginning of the new year has set forth more concisely the tremendous congestion of business that exists in a number of finished steel lines. It is a close question whether in certain products some of the largest makers are not sold up into the closing months of 1920 if not entirely to Jan. 1, 1921. Bars represent probably the most striking example of this condition and a careful apportionment of the coming year's production among different consumers in accordance with the average tonnage shipped to them over the past several years has been put into effect by the largest interest. A leading Detroit automobile builder seeking 280,000 tons of alloy steel for 1920 is meeting with difficulty in placing this order. The paramount question before the mills is one of production and every means is being taken to restore backward outputs to maximum proportions.

Prices Still On Rise

Official reiteration by the Steel corporation that it proposes to hold indefinitely to the minimum schedule of prices promulgated by the industrial board March 21 last, has not checked the advancing movement among many independent mills. Steel bars in the open market now are $13 per ton and plates $12 per ton above the corporation prices. Sheets are difficult to define but are selling $12 to $15 above the minimum figures. A new card on nails being considered by various makers would effect a large raise. Talk of higher prices is heard in mill pipe, and on oil and gas field goods certain mills here advanced $10 per ton. Pittsburgh bar iron makers again have advanced $5 per ton. Sheet bars have been sold at $55 and $56 has been offered for early delivery.

The year starts off favorably in the total of new structural awards, this reaching over 40,000 tons spread over many projects. The largest lot is 6000 tons for a New York office building. The 17,000-ton union station at Chicago is expected to be placed soon. An 8000-ton industrial job is up at Beloit, Wis. Increasing scarcity of steel and the higher prices are holding back some contracts.

Railroads in Market

The presidential announcement of the return of the railroads to private control March 1, has stimulated buying by these companies on their own account. At Chicago over 400,000 tons of tentative rail orders have been converted into contracts. Other rail tonnage has been placed and there is a heavy demand for track fastenings. The Union Pacific has inquired for 3000 cars. Several lots of railroad bridge work have come out for bids.

Pig iron buying is running in quieter channels because the offered supply is so small. The question that agitates buyers and sellers is where all the tonnage needed is to come from as there is much unsatisfied requirement up to April 1 and July 1. Prices are extremely strong and here and there still are rising. Valley basic is up to $37. Foundry iron in eastern Pennsylvania is commanding $42 to $44 furnace for the base grade. Some last half buying has appeared at varying prices. A Buffalo producer has announced a schedule for that period of $40 base or $2 under his first half prices. Last half sales are reported in eastern Pennsylvania and in New England.

Iron Output Recovered

Despite the interruptions of furnace operations arising from the coal strike, December virtually restored pig iron production to the rate in effect prior to the steel strike in September. On Dec. 31, the furnaces in blast numbered 262 as against 263 on Aug. 31, and several since have been blown in. On Nov. 30 the active furnace list was 251. December's output was 2,629,851 tons against 2,407,369 tons in November and 2,742,081 tons in August. The production for the calendar year of 1919 thereby was raised to 30,586,714 tons which is somewhat greater than anticipated several weeks ago.

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Iron Production is Restored

PIG IRON production for the year 1919 made a much better finish than had been anticipated. The output for December showed an appreciable increase over the preceding month rather than a decline as had been freely predicted. While the coal strike caused the banking of a number of furnaces early in the month, the settlement of this controversy fortunately came at a time when the situation for the iron and steel industry had just reached its most critical stage. As a result the banking of a number of furnaces was a matter only of a few days. Furthermore the loss of output so occasioned was more than made up by the resumption of plants which had been idle for a number of weeks primarily due to the steel strike. These plants were in those districts where the struggle had been most stubborn and prolonged, such as Youngstown, Johnstown and Cleveland.

The year has ended in pig iron, therefore, in a more encouraging way than could have been hoped a few weeks back. The December figures of production and particularly the number of furnaces in blast on the last day of the year, signify that the restrictive effects on operations produced by the steel and coal strikes have been almost, if not substantially overcome. While December producing 2,629,851 tons, according to the statistics compiled by THE IRON TRADE REVIEW, still is somewhat below August, the last month prior to the steel strike, the number of furnaces active on Dec. 31 was 262 compared with 263 on Aug. 31. Several additional furnaces since have blown in. Thus it seems, baring unforeseen complications, that January is destined to mark a resumption of the rising line of iron production which was interrupted by the strikes starting in September.

The variations of pig iron output during the past several months are shown by the production record in gross tons dating from August. This is as follows:

August	2,742,081
September	2,480,790
October	1,864,424
November	2,407,369
December	2,629,851

With the calendar year now complete, the production of coke and anthracite pig iron in the United States in 1919 was 30,586,714 tons, according to the statistics of THE IRON TRADE REVIEW. This represents a loss of 8,119,053 tons from 1918, of 7,658,077 tons from 1917, and of 8,475,672 tons from the record year of 1916. The 1919 showing of the furnaces, the poorest since 1915, affords little cause for satisfaction, especially in view of the present widespread shortage of supplies. This record is all the more unsatisfactory when it is considered that probably 2,000,000 tons of this actual loss can be laid to the door of strikes. The industry now faces the future handicapped by the losses and failures of 1919. With the high market and labor disturbances apparently having been passed, the prospects for production in 1920 and especially for the first half, counting the present heavy demand for iron, are appreciably improved.

Let Railroad Tool Buying Begin

PRESIDENT WILSON has allowed 60 days as the period for closing up matters concerning federally-controlled railroads. On March 1, the steam lines are to be returned to private ownership and private operation. That date is expected to open the flood gates of machine tool and equipment buying which have been closed so long. Railroad purchases of machine tools in the past four or five years have been nominal. Machine shop equipment of railroads, particularly of those which have been under government control, has been allowed to run down, and necessary repairs have not been made according to those best informed about railroad machine shop

conditions. Many machine tools are obsolete and numbers of others need replacing because of the treatment they have received at the hands of the mixed class of labor available during the war.

Already indications are present that railroad purchasing agents are becoming active, as shown by the machine tool market reports carried in this issue. More than merely tentative inquiring or estimating, however, is necessary if the railroads are to speed their rehabilitation and restored efficiency after the end of federal control. Arrangements should be made if they are not already available to enable the roads to place their machine tool and equipment orders now, instead of around March 1, since deliveries on machine tools are deferred from four to six months and still are receding. On some equipment, 60-day deliveries still can be made, however, and railroad buyers should be put in a position to take advantage of the situation and enter their orders without delay. It is to the material advantage of the whole country to restore the railroads speedily to their former basis of efficiency and anything that can be done to advance that date should be encouraged as good business and good policy.

Union Leadership Still Falters

SAMUEL GOMPERS, president of the American Federation of Labor, says he finds little to interest him in the plan proposed by the President's second industrial conference for the settlement of labor disputes. Some people will find it chiefly interesting for the opportunity afforded by it to learn the real attitude of the representatives of trade unions in regard to an impartial plan for arbitration and compromise. Mr. Gompers makes it clear that they will have nothing to do with any plan for the adjustment of labor disputes which does not recognize trade unions as the sole organizations through which arbitration may be undertaken, or in other words, which does not give them dictatorial authority over workers who may not be affiliated at present with trade unions.

It is unfortunate for organized labor to have at its head at this time men who will not stop within the bounds of reason, for the chief sufferers in the end will be the members of trade unions. They have had privileges which have placed them in a position many times to enforce unfair and arbitrary demands. They have used the strike frequently when it was unjustified, and now they are in danger of losing certain "rights" which they have had, but which according to all standards of justice they were not entitled to have. The pressure for laws to govern trade unions is growing stronger every day and such statements as Gompers' that he can see little to interest him in the plan will hasten the day when trade unions will be controlled by law, the same as other groups of citizens.

There seems to be no other way out of the difficulties involving trade unions. Either they must accept responsibility, recognize the rights of others as well as their own and agree to settlement of disputes by means fair to both sides, or laws must be passed to define clearly the rights and responsibilities of both capital and labor. And it is more than probable that if such a definition is made trade unions will lose many of the prerogatives which they felt were theirs by divine right.

"The failure of the conference to recognize definitely the organizations of workers, trade unions, as the basis for representation is a fatal omission," says Mr. Gompers. Having conceded the right of workers to be represented by men of their own choice in the hearing of disputes, the conference went as far as it consistently could in recognizing trade unions. The "fatal" blunder would have been committed had the conference said to the 37,000,000 or more independent workers, "You cannot obtain consideration under the terms of this plan unless you join the trade unions." Such an attempt at coercion would immediately have been condemned by the great body of loyal, conscientious workers.

The plan is entitled to thoughtful consideration of every employer and employe. Misrepresentation already is being practiced to befuddle the minds of those trade unionists who might attempt to think for themselves. A high official of the federation has this to say to them: "It is no solution to empower the President and a cabinet official to select representatives of the workers to adjust disputes. The workers must have this power themselves." That is a misleading statement, patent to all who can read the conference's report and who can understand English, but will serve well enough to thimblerig those who cannot.

The plan is still in tentative form, subject to change after hearings which are to be held in Washington beginning Jan. 12. It is not likely, however, to become a real force for allaying industrial unrest, judging by the statements and attitude of the trade union leaders. In the end, the creation of voluntary systems of arbitration which do not exercise any control except through public opinion probably will be found insufficient, and the public will be convinced that it can only expect industrial peace through a policy of legislation and strict law enforcement, parlor bolshevists and "leaders" of trade unions to the contrary notwithstanding.

Iron and Steel Prices

Corrected to Wednesday Noon

SCRAP, WAREHOUSE, ORE AND OTHER PRICES ON PAGES 192 AND 194

Pig Iron

Bessemer, valley	*$38.00
Bessemer, Pittsburgh	*39.40
Basic, valley	37.00
Basic, Pittsburgh	38.40
Basic, delivered, eastern Pa.	40.00
Malleable, Pittsburgh	40.00 to 41.00
Malleable, Chicago, furnace	40.50
Malleable, Buffalo, furnace	39.25
Malleable, delivered eastern Pa.	42.00 to 42.50

FOUNDRY IRON SILICONS

No. 2 Northern	1.75 to 2.25
No. 2 Southern foundry	1.75 to 2.25
No. 2X Eastern and Virginia	2.25 to 2.75
No. 1X Eastern	2.75 and up
No. 1 Chicago	2.25 to 2.75
No. 2 foundry Eastern	1.75 to 2.25

No. 1X, eastern delivered Phila.	$45.10 to 46.10
No. 1X, Buffalo	43.00 to 45.00
No. 1 foundry, Chicago, furnace	41.25
No. 2 foundry, valley, Pittsburgh	40.90 to 41.40
No. 2 foundry, Buffalo	40.90 to 42.00
No. 2 foundry, Boston	44.40 to 44.90
No. 2 foundry, Chicago furnace	40.00
No. 2 foundry, Ironton furnace	38.00 to 40.00
No. 2 foundry, Cleveland furnace	40.00
No. 2X, eastern del., Phila.	43.10 to 45.10
No. 2X, eastern, N. J., tidewater	43.10 to 45.10
No. 2X, eastern, Boston	46.15
No. 2X, foundry, Buffalo furnace	41.25 to 43.25
No. 2 foundry, del., Philadelphia	42.10 to 43.10
No. 2 foundry, N. J., tidewater	42.10 to 43.10
No. 2 southern, Birmingham	36.00 to 37.50
No. 2 southern, Cincinnati	39.60 to 41.10
No. 2 southern, Chicago	40.00 to 41.00
No. 2 southern, Phila.	41.50 to 42.50
No. 2 southern, Cleveland	40.00 to 41.00
No. 2 southern, Boston	45.00 to 46.00
No. 2 southern, St. Louis	40.25 to 41.75
Virginia, No. 2X, furnace	41.25
Virginia, No. 2X, Philadelphia	45.35
Virginia, No. 2X, Jersey City	45.65
Virginia, No. 2X, Boston	45.95
Gray forge, valley, Pittsburgh	38.40
Gray forge, eastern Pa.	40.00 to 40.50
Silveries, 8%, furnace	50.00
Ohio Silveries, 8%, Chicago	53.80
Tennessee Silveries, 8%, Chicago	55.65
Low phos. standard, Phila.	51.80
Low phos. Lebanon, furnace	40.00 to 41.00
Low phos. standard, Pittsburgh	45.40
Charcoal, Superior, base grade, Chicago	47.50

*Nominal.

Coke

(At the ovens)

Connellsville furnace	$6.00
Connellsville foundry	7.00
Pocahontas furnace	8.00
Pocahontas foundry	8.00
New River foundry	8.00
New River furnace	8.00
Wise county furnace	7.25
Wise county foundry	8.25

Ferroalloys

Ferromanganese, 80 per cent. delivered, domestic metal	$140.00
Ferromanganese, 80 per cent, English c.i.f. Atlantic ports	130.00 to 140.00
Spiegel, 13 to 22 per cent furnace spot	45.00
Ferrosilicon, 50 per cent, spot and contract, delivered	80.00 to 85.00
Ferrotungsten, standard, per pound contained, furnace	1.05 to 1.15
Ferrochrome, 60 to 70 per cent chromium, 6 to 8 per cent carbon, per pound contained, maker's plant	22c to 24c
Ferrovanadium, 30 to 40 per cent per pound contained, according to analysis	$6.00 to $7.00
Ferro carbon-titanium, carloads, producers plant, per net ton	200.00
Bessemer, ferrosilicon, 10 per cent	59.50
Bessemer, ferrosilicon, 11 per cent	62.80
Bessemer, ferrosilicon, 12 per cent	66.10

Prices at Jackson and New Straitsville, O.

Semifinished Material

BILLETS AND BLOOMS

(4 x 4 inch)

Open-hearth, Pittsburgh	45.00 to 50.00
Open-hearth, Philadelphia	59.10 to 64.10
Bessemer, Pittsburgh	45.00 to 50.00
Bessemer, Youngstown	45.00 to 47.00
Forging, Pittsburgh	60.00 to 65.00
Forging, Philadelphia	69.10 to 74.60

SHEET BARS

Open-hearth, Pittsburgh	$50.00 to 55.00
Open-hearth, Youngstown	50.00 to 55.00
Bessemer, Pittsburgh	50.00 to 55.00
Bessemer, Youngstown	50.00 to 55.00

SLABS

Pittsburgh and Youngstown	48.00 to 50.00

WIRE RODS AND SKELP

Wire rods, Pittsburgh	$52.00 to 65.00
Grooved skelp, Pittsburgh	2.45c
Sheared skelp, Pittsburgh	2.65c

Shapes, Plates and Bars

(In cents per pound)

Structural shapes, Pittsburgh	2.45c to 2.75c
Structural shapes, Philadelphia	2.70c to 2.80c
Structural shapes, New York	2.72c to 2.82c
Structural shapes, Chicago	2.72c
Tank plates, Pittsburgh	2.65c to 3.25c
Tank plates, Chicago	2.92c
Tank plates, Philadelphia	2.90c to 3.75c
Tank plates, New York	2.92c to 3.77c
Bars, soft steel, Pittsburgh	2.35c to 3.00c
Bars, soft steel, Chicago	2.62c
Bars, soft steel, New York	2.62c to 3.77c
Bars, soft steel, Philadelphia	2.60c to 3.75c
Bar iron, common, Phila.	3.245c to 3.745c
Bar iron, common, Chicago	3.00c
Bar iron, common, Cleveland	3.25c
Bar iron, common, New York	3.27c to 3.77c
Bar iron, common, Pitsburgh	3.75c
Hard steel bars, Chicago	(nom.) 2.85c

Rails, Track Material

Standard bessemer rails, mill	$45.00
Standard open-hearth rails, mill	47.00
Relaying rails, light, St. Louis	40.00 to 46.00
Relaying rails, Pittsburgh	40.00 to 43.00
Angle bars, Pittsburgh base	2.75c
Angle bars, Chicago base	2.75c
Light rails, 25 to 45, mill	2.45c
Spikes, railroad, Pittsburgh	3.25c to 3.50c
Track bolts, Pittsburgh	5.00c
Track bolts, Chicago	4.62c
Track spikes, Chicago	3.62c
Tie plates, Chicago	2.75c to 2.90c

Wire Products

(100 lbs. to jobbers, carloads; retailers, 5c more)

Wire nails, Pittsburgh	3.25c to 4.50c
Plain wire, Pittsburgh	3.00c to 3.50c
Galvanized wire, Pittsburgh	3.70c to 4.20c
Barbed wire, painted, Pitts.	3.40c to 3.90c
Barbed wire, galvanized, Pitts.	4.10c to 4.60c
Cut nails, Pittsburgh l. c. l.	5.195c
Coated nails per count keg, Pitts.	2.85c to 4.00c
Polished staples, Pittsburgh	3.40c to 4.25c
Galvanized staples, Pittsburgh	4.10c to 4.95c

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Chain, Piling, Strip Steel

(In cents per pound)

Chain, 1 in. proof coil, Pitts.	5.75c
Sheet piling, base, Pittsburgh	2.55c to 2.85c

Cold rolled strip steel, hard coils, 1/8 inches and wider by 0.100 inch and heavier, base per 100 pounds, 5.65c to 6.00c.

Sheets

(In cents per pound)

SHEET MILL BLACK

No. 28, open-hearth, Pitts.	4.35c to 5.50c
No. 28, bessemer, Pitts.	4.35c to 5.50c
No. 28, open-hearth, Chi.	4.62c

TIN MILL BLACK

No. 28, open-hearth, Pitts.	4.35c to 5.50c
No. 28, bessemer, Pitts.	4.35c to 5.50c

GALVANIZED

No. 28, open-hearth, Pitts.	5.70c to 7.00c
No. 28, bessemer, Pitts.	5.70c to 7.00c
No. 28, open-hearth, Chi.	5.97c

BLUE ANNEALED

No. 10, open-hearth, Pitts.	3.55c to 4.25c
No. 10, bessemer, Pitts.	3.55c to 4.25c
No. 10, open-hearth, Chi.	3.82c
No. 10, open-hearth, Phila.	3.795c to 4.295c

Full sheet schedule page 192.

Tin Plate

(Per 100 lb. box)

Tin plate, coke base, Pitts.	$7.00

Iron and Steel Pipe

Base Pittsburgh to Jobbers Carloads

Base, Pittsburgh	Black	Galv.
	Per cent off	
3/8 to 3 in., butt, steel	57½	44
3/8 to 3 in., butt, iron	34½	18½

Full pipe schedule page 192.

Boiler Tubes

Steel, 3½ to 4½ inches, l. c. l.	40½
Iron, 3½ to 4½ inches, c. l.	16

Cast Iron Water Pipe

Without War Freight Tax

(Class B Pipe)

Class A pipe is $2 higher than Class B

Four-inch, Chicago	$69.80
Six-inch and over, Chicago	66.80
Four-inch, New York	70.30
Six-inch and over, New York	67.30
Four-inch, Birmingham	63.00
Six-inch and over, Birmingham	60.00

Hoops, Bands, Shafting

Hoops, Pittsburgh	3.05c to 3.50c
Bands, Pittsburgh	3.05c to 3.50c
Hot rolled strip steel, Pitts. stamping quality	3.50c to 3.75c
Cold finished steel bars, Pitts., base	3.60c to 4.05c

Rivets

Structural rivets, Pittsburgh	4.15c
Boiler rivets, Pittsburgh	4.25c
Rivets 7/8 in. and smaller Pitts.	50 off

Nuts and Bolts

(Prices f. o. b. Pittsburgh)

CARRIAGE BOLTS

(1/4 x 6 inches, smaller and shorter)

Rolled thread	45–5 off
Cut thread	40–5 off
Larger and longer	30–10 off

MACHINE BOLTS

(1/4 x 4 inches, hot pressed nuts)

Rolled thread	50–7½ off
Cut thread	40–10–5 off
Larger and longer	40 off
Cold pressed semifinished hexagon nuts 5/8 in. and larger	60–10–5 off
Cold pressed semifinished hexagon nuts 7/8 in. and smaller	70–10–5 off
Gimlet and cone point lag screws	50–10 off

NUTS

Hot pressed, square blank	2.50c off
Hot pressed, square tapped	2.25c off
Hot pressed, hexagon blank	2.50c off
Hot pressed, hexagon tapped	2.25c off
Cold pressed, square tapped	2.25c off
Cold pressed, square blank	2.50c off
Cold pressed, hexagon blank	2.50c off
Cold pressed, hexagon tapped	2.25c off

Prices Present and Past

(Yesterday, a month ago, three months ago and a year ago)

Prices are those ruling on the largest percentage of sales at the dates named.

	Prices Jan. 7, 1920	Average prices Dec. 1919	Oct. 1919	Jan. 1919
Bessemer, valley, del. Pitts. (nominal)	$39.40	$36.65	$29.35	$33.60
Basic, valley, delivered, Pittsburgh...	38.40	35.40	27.15	31.40
*No. 2 Foundry, Pittsburgh	40.90	38.15	28.85	32.40
*No. 2 Foundry, Chicago, furnace....	40.00	38.30	27.55	31.00
Lake Superior charcoal, Chicago.....	47.50	41.00	33.15	38.70
Malleable, valley	39.00	36.90	29.15	31.50
Malleable, Chicago	40.50	38.80	28.00	31.50
*Southern, No. 2, Birmingham.....	36.75	35.15	27.45	32.25
*Southern Ohio, No. 2, Ironton.....	38.00	36.55	28.80	31.00
Basic, eastern del., eastern Pa.....	40.00	35.75	27.90	33.90
**No. 2X, Virginia, furnace.....	41.25	38.25	30.35	35.25
*No. 2X, eastern del., Philadelphia..	43.50	40.75	32.00	36.15
Gray forge, valley del., Pittsburgh...	38.40	36.00	27.65	31.40
Ferromanganese, 80 per cent, delivered	130.00	120.00	110.00	217.00
Bessemer billets, Pittsburgh.....	50.00	45.00	39.30	43.50
Bessemer sheet bars, Pittsburgh.....	51.00	48.50	43.20	47.00
Open-hearth sheet bars, Pittsburgh....	51.00	48.50	43.20	47.00
Open-hearth billets, Pittsburgh.....	50.00	45.00	39.30	43.50
Steel bars, Pittsburgh.....	3.00	2.65	2.35	2.70
Steel bars, Chicago.....	2.62	2.62	2.62	2.97
Iron bars, Philadelphia.....	3.495	3.375	2.745	3.745

	Prices Jan. 7, 1920	Average prices Dec. 1919	Oct. 1919	Jan. 1919
Iron bars, Cleveland.....	$3.25	$3.25	$2.75	$3.32
Iron bars, Chicago mill.....	2.87	2.80	2.68	3.13
Beams, Chicago	2.72	2.72	2.72	3.07
Beams, Pittsburgh	2.65	2.45	2.45	2.80
Beams, Philadelphia	2.80	2.745	2.695	3.045
Tank plates, Pittsburgh	3.00	2.70	2.65	3.00
Tank plates, Chicago	2.92	2.92	2.92	3.27
Tank plates, Philadelphia	3.50	3.125	2.895	3.245
Sheets, blk., No. 28, Pittsburgh.....	5.00	4.35	4.35	4.70
Sheets, blue anld., No. 10, Pittsburgh	4.00	3.55	3.55	3.90
Sheets, galv., No. 28, Pittsburgh.....	6.25	5.70	5.70	6.05
Wire nails, Pittsburgh.....	4.25	3.80	3.25	3.50
Connellsville furnace coke.....	6.00	6.15	4.15	5.90
Connellsville foundry coke.....	7.00	7.15	5.60	7.00
Heavy melting steel, Pittsburgh.....	26.00	24.65	20.00	20.80
Heavy melting steel, eastern Pa.....	23.50	23.15	19.55	19.00
Heavy melting steel, Chicago.....	24.75	21.00	18.80	19.20
No. 1 wrought, eastern Pennsylvania..	32.50	30.75	27.00	29.80
No. 1 wrought, Chicago.....	28.00	27.00	22.00	23.30
Rerolling rails, Chicago.....	33.00	31.30	26.80	22.30

*1.75 to 2.25 silicon. **2.25 to 2.75 silicon. †70 per cent.

Last Half Iron Buying Appears

Sales Are Made in Eastern Pennsylvania and New England at Varying Prices—Buffalo Maker Quotes $2 Lower After July 1—Valley Basic Advances to $37—Furnaces Still Sell Conservatively

Cleveland, Jan. 6.—Unsatisfied demand for pig iron continues far in excess of offers and wherever occasional sales are made they are virtually at any price which the furnace cares to ask. While the open inquiry is not so heavy there is a big receptive demand and producers state they would have no difficulty in booking a tremendous tonnage if it were available. Basic iron now is quotable at $37, furnace, sales having been made at that figure for second quarter including one lot of 5000 tons which went to a valley interest. Another buyer has offered this price on 5000 tons for first quarter. The American Steel Foundries has been inquiring for 10,000 to 15,000 tons for second quarter and has bought partially against this. Several northern Ohio steel works are willing to take on blocks of basic wherever they can find it. Cleveland furnaces are selling practically nothing but such occasional orders as they are booking indicate a market level of $40, furnace, for 1.75 to 2.25 silicon. One sale of off-iron was made on this basis and another of 5 per cent silicon, the latter bringing $48, furnace. Some producers continue to hold unchanged their schedule at $38, furnace, for the base grade but they are accepting little business except an odd lot here and there. There is some inquiry in surrounding territory for last half iron but no furnace yet has quoted on this. The foundries are having considerable trouble in obtaining coke and some of them have had to restrict operations. Some of the furnaces also are having trouble to get sufficient coke. The McKinney Steel Co. has blown in another furnace in this city and now has its full group of four in operation. The Canton, O., furnace is expected to resume within a week.

Prices Cover Wide Range

New York, Jan. 5.—Pig iron prices continue to cover a wide range. The minimum figures, however, now are not as low as a week ago and at the same time the amount of iron selling at the higher prices is increasing. The lowest price reported on eastern Pennsylvania iron during the past week are $41, furnace, for 1.75 to 2.25 silicon and $42, furnace, for 2.25 to 2.75 silicon for shipment over the first half. Considerable tonnage, however, was sold at $42 and $43, and even $44, eastern Pennsylvania furnace, for 1.75 to 2.25 silicon, and at prices ranging up to $45 for 2.25 to 2.75 silicon. One eastern consumer bought a round tonnage of 2.25 to 2.75 silicon for second half from another district at a price equivalent to higher than $46, eastern Pennsylvania furnace. A good deal of tonnage has been sold during the past week despite the holidays, and there is considerable new inquiry. The Virginia Iron, Coal & Coke Co. now is offering for a limited period first half foundry at $40, furnace, for 1.75 to 2.25 and $41.25 for 2.25 to 2.75 silicon, etc. Practically all Virginia iron is held at this level and some even has been sold higher. However some Virginia iron has been offered during the past week at the old price of $39.25, furnace, for 2.25 to 2.75 silicon. A round tonnage of Alabama iron has been sold in this district for first half at $38, Birmingham, for silicon around 3 per cent. About 3000 tons of basic have been sold to a New England consumer for second quarter at a price reported to have been equivalent to $40, delivered eastern Pennsylvania. Cranberry furnace, Cranberry, Tenn., blew in on standard low phosphorus iron on Dec. 19.

There is a fair amount of export inquiry in the market, and some of it is of a firm character but the exporters find it difficult to get the iron.

Quotes Lower Price for Second Half

Buffalo, Jan. 6.—One furnace interest in this district is now quoting on second half iron. This maker is willing to take his chances on costs and sell at a general decrease in prices over first half. His schedule of prices is as follows: No. 2 plain (1.75 to 2.25 silicon) first half $42, second half $40; No. 2X (2.25 to 2.75 silicon) first half $43.25, second half $41.25; No. 1X (2.75 to 3.25 silicon) first half $45, second half $43. This interest reports that offers for spot iron have gone as high as $50, and that there will be an acute shortage of iron in this district in a short time. It reports sales during the past week, of 10,000 to 20,000 tons of iron, and new inquiry for about 15,000 tons of foundry. No other furnace has yet evinced a willingness to take on any second half commitments, and quote the same price for first half that the first mentioned furnace asks for second half, that is, $40 base. Nominal price for malleable iron, although none is being produced here, is $41.25, while the nominal price for basic is $39.

Chicago Market Listless

Chicago, Jan. 6.—Holiday dullness has been so prevalent in the pig iron market at Chicago that there are no features. Demand has been less manifest, not so much that melters are

not in need, but rather that they have been too busy to pursue the fruitless task of seeking to buy iron where none is available. The leading interest has taken a few contracts for small tonnages at $40, furnace, for 1.75 to 2.25 silicon, entirely from regular customers. At the present moment this interest feels it has nothing further to sell and is even uncertain whether it will be able to produce sufficient to meet its obligations. Inquiry and sales are comparatively small. A recent sale of 500 tons of foundry iron for first half delivery was made to a Wisconsin melter. A Michigan consumer of malleable iron is inquiring for 1000 tons of that grade. Southern producers have been quoting $36, Birmingham, but one large producer is now asking $38, Birmingham, and is willing to extend delivery into second quarter at this price. At least one southern stack is asking $40, Birmingham, these figures all being on the basis of silicon 1.75 to 2.25. Lake Superior charcoal has been quoted by one interest at $45, furnace, with $2.50 freight to Chicago. One other maker is understood to have quoted $50, furnace, for the base grade. One Jackson county stack has just blown in on silvery but the other two producers are still idle. The Jackson county quotation on 8 per cent silvery is $50, furnace, while on bessemer ferrosilicon $59,50, furnace, is quoted for 10 per cent. Some spot iron becomes available from time to time as consignment iron owned by brokers is forwarded from southern sources.

Furnaces Withholding Commitments

Cincinnati, Jan. 5.—Conditions in the pig iron market are such as practically to eliminate the possibility of sales contracts for even indefinite delivery. The shortage of coke is one of the important factors curtailing production. No sales of pig iron are reported. Demand is active, but producers are not in a position to make commitments. There is a decidedly firm tendency in the market, but in the absence of contracts furnace interests will not venture to advance prices, although waiting to resume production on a big scale.

Market Continues Strong

St. Louis, Jan. 5.—Although the pig iron market continues to keep its strength, there is no indication of a clarification of prices within the immediate future, and for the present, business has practically come to a halt, chiefly because producers have nothing to sell. Books of southern producers have not been opened any wider than they were Dec. 31, and the situation has developed to the stage where consumers will not negotiate unless the seller can state positively that he has something to dispose of. It is aparent that furnaces have booked all orders they can handle and are confining attention to such customers as are in dire need of supplies. Most of the large users are well provided for, but it is known that a number of the small consumers have been obliged to substitute heavily with scrap. Shipments have been disappointing, due to the fact cars are scarce. The holidays caused a reduction in labor efficiency and cold weather to some extent has interfered. One southern furnace representative is said to have orders aggregating 4000 tons of No. 2 (1.75 to 2.25 silicon), but is unable to obtain authorization to accept the business. For No. 2 southern, the price mentioned is $37, Birmingham, but as far as can be learned, there is none to be had. A small tonnage of 3.37 to 4.25 silicon, was offered for prompt shipment at $43.30, Birmingham, while a small tonnage of northern No. 2, (1.75 to 2.25 silicon) was offered at $41, Chicago.

Sell Second Half Iron

Philadelphia, Jan. 6.—Pig iron in this district has been featured by fair buying over the holiday period. This has involved mostly foundry iron at prices varying from $41 to $45, eastern Pennsylvania furnace for No. 2 (2.25 to 2.75 silicon). Altogether many thousands of tons were involved some of which was second half. However, no many makers are willing to book second half business now. It is believed no makers now are quoting less than $43, eastern Pennsylvania furnace for No. 2X, and $1 less for No. 2 plain (1.75 to 2.25 silicon), but the volume of business at higher levels is growing. Central Pennsylvania foundry was sold during week at $41, furnace, for No. 2, but the minimum asking price for that district now is $42, furnace, for No. 2 plain, and $43.25 for No. 2. A Virginia company is offering for first half at $40, furnace, for No. 2 plain and at $41.25 for No. 2X for first half and other Virginia makers are quoting the same. However, some Virginia first quarter now has been offered by merchants at $39.25, furnace, for No. 2. The output in Virginia will be increased by the blowing in of Edward E. Marshall's Graham furnace on foundry early in February. The Pulaski furnace also will be blown in in February after relining. It is reported here that no sales of Buffalo foundry iron have been made by first hands at higher than $40 basis for No. 2 plain. A substantial tonnage of copper-free low phosphorus has been sold at $48, furnace, and a large tonnage is under negotiation. No business is reported in copper-bearing iron. The general asking price on basic is $40, eastern Pennsylvania furnace, but no business is reported. One large interest requiring plates for shipbuilding and producing pig iron is negotiating with a plate maker to arrange trade of pig iron for plates. Bessemer iron can be had at $40, eastern Pennsylvania furnace. Malleable has been sold at $41, eastern Pennsylvania furnace and makers now are holding for more. Much gray forge could be sold but apparently none is obtainable.

Southern Prices Advancing

Birmingham, Ala., Jan. 6.—Southern furnace companies are still advancing the prices of pig iron, sales having been made during the past week on a basis of $37.50 for No. 2 foundry (1.75 to 2.25 silicon). A dollar premium over this price has been paid. Reports were current that a small tonnage of No. 2 foundry was sold as high as $40. Inquiries have been received here as to pig iron for delivery during the last half of the year but no sales have been made. The goal for production in 1920 has been set at more than 3,000,000 tons. Car service is good.

Year Starts Off Quiet

Pittsburgh, Jan. 6.—The first week of the new year has been a quiet one ni the pig iron market here, but this is a normal condition and has caused no uneasiness or softening in prices. The market has a strong undertone and some substantial advances over the prices of last sales have been named against inquiries for the steelmaking grades. A Pittsburgh district steel manufacturer who recently put out an inquiry for a round lot of standard bessemer, was quoted $40, furnace, and the same price is reported to have been quoted on basic. That is several dollars a ton above the basis at which round lots recently have been sold. The market is quotable at $37 furnace on standard basic, and standard bessemer is indefinite in the absence of sales. Spot supplies of both grades, except in the hands of the brokers, are limited and early tonnages might be hard to find in quantities at these quotations. Blast furnace interests are taking on small tonnages of foundry around $40, furnace, for No. 2 foundry (1.75 to 2.25 silicon), while the National Transit Pump & Machine Co., Oil City, Pa., recently closed for about 2000 tons of this grade, paying, it is reported, somewhat less than $40 furnace. This iron was for second quarter delivery. An exporting inquiry for 1000 to 2000 tons of high silicon iron for prompt shipment recently reached this market but received little or no attention, owing to the lack of supplies. The National Radiator Co., Johnstown, Pa., is seeking 2000 tons of foundry for last half, but this inquiry also is not interesting to furnace interests who prefer to wait awhile before committing themselves so far ahead. While the general attitude of buyers at the moment is one of caution, producers are not pressing sales in view of the fact that the coke situation is affecting production considerably, not only here but in all other districts, and it is considered probable that much first quarter business will become second quarter obligations. Because of the car shortage and the observance of the Russian church holiday, coke production is light even for this time of the year and few blast furnaces are getting as much coke as could be used.

Sell Last Half at $43.25

Boston, Jan. 5.—While tightness in pig iron still continues, the opening of the new year was also the occasion for opening up the books of several new furnaces supplying the New England market. The Virginia Iron Coal & Coke Co., after having offered a small block of first quarter iron some weeks ago has now come into the market at a $5 advance for first half. It is offering No. 2X Virginia (2.25 to 2.75 silicon) at $41.25, furnace. Eastern Pennsylvania furnaces are offering second quarter and first half iron at $42, furnace. A feature of the eastern Pennsylvania situation is the offering of last half iron by several furnaces and sales aggregating several thousand tons have been made at $43.25 for No. 2X for that de-

livery. The lowering of the rail and water freight rate from the Alabama district to New England has caused renewed interest in iron from the south. Some textile machinery manufacturers have already made large purchases and others are contemplating placing orders in the near future. The General Electric Co. is asking for 7000 to 8000 tons of 2X and higher silicon iron for its Lynn and Pittsfield, Mass., plants. A western Connecticut foundry is asking for 2500 tons of iron for second quarted. Sales during the past week were heavy and the amount sold from Virginia alone for New England delivery amounted to nearly 8000 tons. An eastern Connecticut consumer took 1500 tons. Another Connecticut consumer 500 and a third 300. A Rhode Island consumer took 600 tons and many Massachusetts consumers bought lots ranging from several cars to 2000 lots. Sales from Alabama indicate a departure from the recognized schedule of differentials. Iron of 1.7 5to 2.25 silicon has sold for $38, furnace, while the 2.25 to 2.75 silicon grade brings $29.50 and the 2.75 to 3.25 silicon iron $31. This is the policy of two of the furnaces.

Ore Supplies Still Large

Cleveland, Jan. 6.—No business has yet been done in the iron ore market for 1920, and some of the operators are now making final shipments to furnaces on contracts closed last year. A canvass of the situation shows that the available supply of iron ore at furnaces and lower lake ports is larger at this time than it was a year ago. Furnace companies are not expected to estimate their requirements before spring, unless there should be an unusually large consumption of ore in the meantime. The prices for 1920 have not been decided on, although it is generally anticipated that the leading operators will make an advance when new contracts are considered. Inquiries are out for good tonnages of foundry ore.

The McKinney Steel Co., Cleveland, has renewed for 20 years its lease on the Commodore iron ore mine at Virginia, Minn.

Warehouse Prices Up

Philadelphia, Jan. 6.—Warehouse prices in this district are higher in a number of lines. Steel bars now are quoted at 3.75c; iron bars at 3.75c; No. 10 blue annealed sheets at 5.25c; No. 28 black sheets at 6.50c to 9.00c; and No. 28 galvanized at 7.50c to 10.00c.

Stores Advance Sheets

Chicago, Jan. 5.—While the action of the leading interest in holding warehouse prices to the schedule prevailing during most of 1919 has prevented an increase in quotations on most products, advances have been made in a few cases. Independent storekeepers have moved their quotation on No. 10 gage blue annealed sheets to 4.82c on No. 28 gage black sheets to 6c, and on No. 28 gage galvanized to 7.50c. Rivets have been moved up to 4.97c and bands, 3/16 and less, to 4.32c.

Coke Supplies Still Short

Lack of Transportation and Results of Holiday Celebrations Curtail Output —Connellsville Production Falls Off 6,000,000 Tons in Year

Pittsburgh, Jan. 6.—Although favored at times with a slightly improved car supply, the production of beehive oven coke still reflects the lack of transportation facilities and the results of the holiday season. The fact that coal is not yet moving to the steel companies' by-product plants sufficient to permit of full operation of the latter, coupled with the fact that merchant blast furnace interests are searching for supplies keeps the situation extremely taut. With the celebration of the Russian Christmas and New Year holidays in progress, it probably will be a week or so before the mines and ovens again have anything approaching a normal complement of men and even then improvement in the production of both coal and coke will be governed by the car supply. When the number of cars will be larger is merely a matter of guesswork. Some see no real improvement in this direction in the near future, while others expect it will come shortly as a result of the desire of the railroad managements to get ready for the passing of government control. Lack of competition for business between railroads while under control of the government is given as one cause of the present condition, for there has been no incentive for efficient service. Control of coke prices is all that prevents higher quotations. Enactment of the peace treaty and the proclamation of peace would automatically end the Lever law, giving the President control of fuel and food, and this would mean the restoration of a free, open market in both coal and coke. The production of coke in the Connellsville region in the week ended Dec. 27, is estimated by *The Connellsville Courier* to have been 205,850 tons against 247,184 tons in the previous week. For the year, production is estimated at 10,279,648 tons, against 16,138,590 tons in 1918.

Supplies Are Scarce

New York, Jan. 5.—Comparatively little business now is being transacted in the coke market. This is due largely to lack of supplies since there is a good deal of unsatisfied inquiry. At the same time, inquiry for coke is not as large as a few weeks ago. Most of the scarcity at present is in furnace coke, since it is possible to get foundry coke for spot shipment. The northern New Jersey by-product coke maker continues to quote $7.50 Connellsville, on foundry coke and $8.69 ovens, on furnace coke. This maker has sold considerable tonnage of furnace coke lately.

Scarcity Is Felt

St. Louis, Jan. 5.—Spot coke is virtually unobtainable, and dealers in the district state that if the government fixed price was removed, it would advance from $1 to $2 a ton. Premiums are being offered, but dealers are not taking advantage of them, chiefly because they have no coke to sell, and furthermore because they wish to obey the mandate of the government, which compels them to charge no more than $7 a ton. Deliveries are slow. The leading by-product interest is working at capacity and its output has helped somewhat to relieve the general situation. Inquiries for future delivery have fallen off somewhat, chiefly because consumers have to some extent lost interest.

Production Increasing

Birmingham, Ala., Jan. 6.—Coal and coke production in Alabama is steadily improving. Demand exceeds output. The by-product coke ovens of the Sloss-Sheffield Steel & Iron Co., North Birmingham, will be delayed again and may not be operated before three or four months. The anticipated production of coal in Alabama this year is 21,000,000 tons, and for coke, over 4,000,000 tons. Railroads are giving fairly good service.

Market at Standstill

Cincinnati, Jan. 5.—Inadequacy of transportation facilities is responsible for the scant supply of coke, for there are at certain points relatively large accumulations, which the producers have been unable to move because of the continued car shortage. The market literally is at a standstill, despite an urgent demand. What few deliveries buyers have been able to obtain have been at the minimum regulated prices. Were it not for the government restrictions there is every evidence that the schedule of prices would be higher. Consumption would readily become normal if the supply was available.

Coke Property Sold

Pittsburgh, Jan. 6.—Official announcement has been made of the sale of the Orient Coke Co., owning 1000 acres of coal land and operating 480 beehive coke ovens, at Orient, just outside of Uniontown, Pa., to the Reilly-Peabody Fuel Co. of Pittsburgh. The company formerly was owned by Julian Kennedy of Pittsburgh. It is understood that the consideration was $2,000,000, of which the Reilly-Peabody company is said to have advanced half, the remainder being put up by steel companies in the shape of contracts for the coke. While the names of the steel interests are withheld, it is commonly stated here that the Midvale Steel & Ordnance Co. and the Wheeling Steel & Iron Co. are the companies interested. The American Coke Corp. a Reilly-Peabody subsidiary will hold title to the property.

The Standard Wheel Works of Terre Haute, Ind., has been succeeded by the Standard Wheel Co., with Carl D. Fischer president, Emil Fischer, vice president and Walter C. Clark secretary-treasurer.

Scrap Market Livelier

Heavier Buying Results in Advances in Most Districts—Heavy Melting Steel Sells Up—Dealers Hold to Stocks

FOR COMPLETE SCRAP PRICES SEE PAGE 194

Chicago, Jan. 6.—For the second time recently No. 1 cast scrap now is being quoted above the current price of pig iron, and by a considerable margin. Sales have been made at this level, and the supply is scarce. Inasmuch as pig iron deliveries are lagging on account of interference with production and shipments, foundries are seeking from other sources as much cast scrap as can be obtained. The matter of price does not seem to count in the purchase, and foundries will pay higher for actual scrap than they would for a pig iron contract on which deliveries are uncertain. Heavy melting steel appears likely to weaken, as two large steel works have bought round tonnages lately and are covered for most of their requirements for several months. One buyer has taken approximately 50,000 tons. Another bought 25,000 tons of heavy melting steel and shoveling steel. With this tonnage of orders it seems likely that dealers may hold the market down somewhat until they are filled. Rolling mills are not buying freely and scrap for this purpose is not as strong as some other grades. The Chicago & Northwestern railroad has issued a list containing 2760 tons of which 1000 tons is No. 1 steel rails and 600 tons No. 1 wrought. The Burlington railroad offers 270 tons and the Erie railroad has issued a list without tonnages being specified.

Prices Advanced at New York

New York, Jan. 5.—An acute scarcity has developed in steel axles. Heavy buying by the rolling mills and substantial purchases for export shipment have stripped the market, and such material as is being held, is being offered at advancing prices. One seller is holding steel car axles at $45, and another at around $46; however, material can be bought at approximately $40 to $42, f.o.b. New York, there being at least 1500 tons available at these prices. Iron car axles, while not in such heavy demand, are exceedingly scarce, and quotations have increased considerably, the market now being $48 to $50, f.o.b. New York. Another grade of scrap to advance is machinery cast, the market holding at $33 to $34. Heavy cast, while not making such a material gain, is holding at advanced figures, offerings ranging from $29 to $30. Substantial buying by the foundries has resulted in the shortage of supplies. Reflecting the advance in heavy and machinery cast, prices on stove plate and grate bars have gone up $1. Wrought material is also higher by $1 than the market last week. No. 1 railroad wrought is holding at $28.50 to $29, f.o.b. New York, and city wrought, long stock, $22.50 to $23. Wrought pipe is unchanged. Heavy melting steel is moving upward less slowly than most other grades, a development which is accounted for in part by the heavy purchases made recently. The market may be quoted at $19 to $19.50, f.o.b. New York.

Eastern Demand Is Better

Philadelphia, Jan. 6.—The leading sale in scrap metal is 6000 tons of heavy melting steel to the Worth Steel Co. at $23.50 delivered. The demand generally is better and especially is active in yard wrought, No. 1 railroad wrought, cupola cast and iron axles and there are indications of early improvement in steel shafting. Frog, switch and guard rails now are lower than heavy melting steel because only one mill in the east will accept the former grade.

Seeking Higher Prices

Pittsburgh, Jan. 6.—While steel manufacturers generally have not begun to seek supplies of scrap, a few of them are in the market and this has caused a new advance of about $1 per ton in practically all of the open-hearth grades. A wide gap exists between the prices dealers seek and what buyers are willing to pay. Heavy melting steel is held by most dealers at $27, although no business has been done above $25, and buyers generally hesitate to pay more than that. Something of a deadlock exists over prices between buyers and sellers and the turnover in steel works grades is limited. Dealers have lost none of their optimism. Although all are carrying heavy stocks, the expectation that the market will gain in strength and activity in the near future encourages them. As high as $30 is talked of for heavy melting steel. Scarcity of foundry and iron rolling mill grades of scrap continues, still higher prices prevailing on most of these grades. Billet and bloom crops are hard to find at less than $32, and sheet bar crops for piling recently have sold as high as $29 at place of origin. Shortage of gas has restricted steel works activity and scarcity of these grades partly is ascribed to that fact.

Market Shows New Life

Cleveland, Jan. 6.—Scrap iron and steel in this district has awakened with renewed vigor from its holiday lull, and every grade on the list has advanced. Heavy melting steel has jumped from $21.25 and $22 to $23.50 and $24, and other descriptions have kept pace. Where dealers a few weeks ago were talking of $25 melting steel they now forecast $30 steel, and are holding on tightly to their accumulations. Probably the main reason why prices have jumped is the entrance of one of the larger consumers of melting steel and turnings. This interest, which was not expected in the market for several months because of its large stock of scrap paid $24 to $24.50 for steel and $15.25 for turnings. Several other large buyers of scrap are expected to follow suit, and the result is that prices are the strongest in months. Dealers who claimed they were holding for $25 steel now are not letting go a pound.

Demand is Active at Buffalo

Buffalo, Jan. 6.—Demand for all grades of scrap is strong, and prices of machinery cast, malleable turnings, axle turnings, grate bars, stove plate and bundled sheets have advanced. There is a shortage of cast scrap, although the demand for this material is not excessive. Large tonnages are not to be had at the listed prices. The price of heavy melting steel has not been increased, although other districts are reported to be quoting $26. Stocks are being held in dealers' yards in anticipation of higher schedules. There is a shortage of cars, and a shortage of labor at the yards. The supply of scrap has been somewhat curtailed during the past 10 days by the holiday inactivity of some mills.

Market Is More Active

Cincinnati, Jan. 5.—The scrap market is more active, having livened up considerable since the holidays. There is not the activity that had been anticipated however. The market is strong nevertheless with an advancing tendency and a few grades are quotably higher.

Scrap Outlook is Good

St. Louis, Jan. 5.—Dealers in scrap are holding off to see what the mills intend to do in the matter of purchases and acceptance of material under contract, and consequently the market is in a waiting position. The St. Louis Screw Co. has made substantial purchases but still requires considerable tonnage. Little scrap of any description is coming to light. The railroads did not issue a list during the past week, but are expected to put out some within a few days, and until that time it is expected dealers generally will not revise their price lists. As a whole the tone of the market is strong. Locomotive tires were marked up $3 during the week, now being quoted at $26 to $26.50. Other advances were noted, but for the most part prices were steady.

Southern Market Strong

Birmingham, Ala., Jan. 6.—The southern scrap iron and steel market is strong, and dealers are taking profits instead of speculating. A general revision of quotations has been announced. Railroad cars bringing in old material are being used to make deliveries to consumers. Every indication points to a big consumption of old material. Heavy stocks of old material are on hand.

Pay High For Steel

Boston, Jan. 5.—Although dealers generally report rather quiet conditions in scrap iron and steel, large sales have been made by the railroads, the Boston Elevated and other companies where scrap accumulates in large quantities. The Bethlehem Shipbuilding Corp. sold 1500 tons of heavy melting steel at $21 shipping point which, because of a 50 cent switching charge actually amounts to

$21.50, Quincy, Mass. This is one of the highest prices quoted for heavy melting in Massachusetts during the present season, and it is interesting to note that the Bethlehem Steel Co. which usually has the inside track in the sales from the Quincy plant was outbid in the recent transaction. The steel company did, however, obtain a large quantity of turnings for which it paid approximately $14 f.o.b. shipping point. The difficulty in obtaining cast scrap still is apparent on all sides. Consumers in fact have been so anxious in some cases that substantial premiums have been offered.

Higher Prices

Talked of in Mill Pipe—Some Classes Raised $10 Per Ton

Pittsburgh, Jan. 6.—Much talk is heard here of higher prices for pipe. Thus far, however, barring the issuance of a new card carrying an advance of approximately $10 per ton in drill and drive pipe and oil well casing by some of the independent companies and the elimination of the discounts on water well casing in cut lengths, which has been placed on a "price upon application" basis, general quotations hold on the bases of the past nine months. Unhampered operation of the law of supply and demand undoubtedly would mean sharply higher prices for oil country and line pipe, demands for which are on an enormous scale, with buyers quite willing to pay almost any price that might be asked if by so doing they were assured of fairly early shipments. The National Tube Co., however, in keeping with the policy of the United States Steel Corp., is adhering to the March 21 bases, and is making no attempt to take advantage of the situation. This tends to discourage advances by some of the independent companies. The leading interest is taking business for shipment practically for the rest of the year on a basis of prices at time of delivery. It has adopted this policy in the belief that if buyers secure no financial benefit by ordering now they will be less likely to overpurchase. The fact that the company is sold well into the last quarter of the year, indicates that buyers want to be protected regardless of the price.

Advance $5 in East

New York, Jan. 5.—Prices on cast iron pipe in the East have advanced $5 a ton, the market on 4-inch class B material being $70.30, and on 6-inch and over, $67.30. Class A pipe is holding at the usual differential of $2 over these prices.

Detroit Rejects Bids

Chicago, Jan. 6.—Bids on 9200 tons of pipe for the city of Detroit were rejected after being opened Dec. 30, and new bids will be asked, with the tonnages possibly increased. Elyria, O., will open bids Jan. 6 on 300 tons in addition to the large tonnage on which figures were taken several weeks ago on which the award has not yet been made. Havre, Mont., opened bids Jan. 5 on 110 tons.

Plate Lots Seek Mills

Inquiry for 20,000 Tons Fails to Find Taker in East—Car Tonnage Pending—Liberal Tonnage Placed at 3.25c and 3.50c

Philadelphia, Jan. 6.—Prices now quoted by eastern plate mills range from 3.25c to 3.50c, Pittsburgh. The latter is the minimum figure now quoted by one large maker, and it has booked a large business during the week. Some of the week's business also was done at 3.00c, Pittsburgh, but this is no longer being quoted by any of the companies having reasonable deliveries to offer. The mills are still quoting 3.25c, Pittsburgh. All are taking only such business as is forced on them. Some mills, by reason of their sold up condition are accepting only portions of tonnages being offered to them at 3.25c and 3.50c, thus in effect following a policy of rationing consumers One eastern mill closed up on 27,000 tons for the west during the week. Many large lots, including one of 20,000 tons, cannot find takers. The Sun Shipbuilding Co. has placed additional ship tonnage. While the foregoing prices are being done by companies having deliveries to offer in not more than three or four months on sheared plates and one to three months on universals, the Carnegie Steel Co. continues to take care of its regular trade at 2.65c, and one independent has not gone above 2.75c, although they are taking only what they cannot avoid.

Southern Pacific Buys Boats

New York, Jan. 5.—The Southern Pacific Steamship Co., which recently was inquiring for three cargo boats, each 6500 tons, and three of 5250 tons each, has placed three of these boats with the Downey Shipbuilding Corp. It is not known whether or not the other three will be placed. All shipyards in the east have about all the work they can do, and are turning away many orders. It is difficult to obtain steel for vessels. Many thousands of tons of ship plates and shapes have been turned away by the mills in this district during the past week.

Buyers Offer 3.50 Cents

Pittsburgh, Jan. 6.—Not only has business been done here in plates as high as 3.25c, Pittsburgh, but buyers in their anxiety to be protected against their future requirements have made firm offers of 3.50c. A sale is noted of 1000 tons to a Pittsburgh district maker of tanks at 3.25c, the tonnage to be supplied at the convenience of the manufacturer. Although the Carnegie Steel Co., a short time ago made a quotation on ship plates of 2.50c, the independents are not quoting less than 2.65c, and that price is merely nominal with a number who at present are taking no business. Independent mills in a position to take on early business and guarantee shipments are not quoting less than 3.00c. Business is on the books of makers at prices from 2.50c to 3.25c, but the prompt market generally is 3.00c or more. Largest demands continue to come from the tank builders and fabricating interests, but car, locomotive and ship builders are more active and railroad buying is beginning to develop.

Not Quoting for Second Quarter

Cleveland, Jan. 6.—While the largest plate mill in this district is accepting a small amount of business from some of its regular customers at 3.25c, Pittsburgh, this is but a small fraction of the business which it is forced to turn away because of the fact that it is sold up for the first quarter. It is not quoting for the second quarter. Large premiums could be obtained from anxious buyers for plates for prompt delivery, and tempting offers are being refused. Substantially three months' business was carried over from last year. About 10,000 tons of steel for four boats which the American Shipbuilding Co. will build for its own account here have been covered.

Tank Plates for Export

Chicago, Jan. 6.—An inquiry is current for 4500 tons of steel plates and a small tonnage of shapes to be fabricated into 40 tanks for export to a European country. This tank inquiry is in line with the principal source of business for plate mills at present. Railroads appear to be entering the market at present for some special types of cars which require considerable tonnage of steel plates. The Union Pacific railroad has an inquiry for refrigerator cars which will require 21,000 tons of plates and shapes. Oil storage and transportation continues to require considerable plate tonnage for tanks and tank cars. The leading interest continues to quote 2.92c, Chicago mill, for plates.

Tin Plate Demand

Still Heavy, While Lack of Transportation Restricts Output

Pittsburgh, Jan. 6.—Restricted transportation facilities combine with a shortage of steel to hold in check the production of tin plate. Since manufacturers have not yet been able to make any appreciable inroads on their bookings, shipments remain moderate and buyers eagerly are seeking supplies to tide them over until the situation improves. Few makers are inclined to consider new demands until they have reduced their obligations, although buyers are offering premiums over base of $10 a ton or more. Live business sufficient to keep the mills running full for at least three months was carried over into this year, exclusive of the 1920 business entered since the middle of last November, when books were opened by the independent manufacturers for first quarter and by the American Sheet & Tin Plate Co., for the first half of this year. Tin plate soon will be moving west for the opening of the salmon packing season. Oil can re-

Steel Bars Hard to Buy

Leading Mills Sold Through First Half and Beyond—Prices Higher—Bar Iron Demand Stimulated—Pittsburgh Up to 3.75c

Chicago, Jan. 6.—Neither the leading interest nor the leading independent is able to take soft steel bar tonnage for delivery during first half except a possible small tonnage occasionally when it fits into a rolling schedule. As a general statement, no more soft steel bars can be obtained for first half. The quotation remains nominal at 2.62c, Chicago mill. Bar iron is receiving most inquiry in the absence of available soft steel and this is heavy. The present quotation is 3.00c, Chicago mill, with occasional tonnages taken at a higher figure but no recent quotations have been entering this market. Most business is on spot sales and mills have accumulated a backlog equal to about two months production. Railroad inquiry is much better. This class of buyers has been asking contracts covering first quarter requirements which is the first time in months that such requests have been made. There have been evidences that contracts over longer periods would be made if mills would allow it. Inquiry for hard steel bars is unusually strong, also due to lack of soft steel bars and is being received from manufacturers and reinforced concrete users and every line of consumption that has used this form of material. Mills have backlogs ranging up to three months production, and a strong inquiry in addition. Contracts at present are being made without definite price, the material to be paid for at the price prevailing at the time of delivery.

Price Range From 2.35c to 3.50c

Philadelphia, Jan. 6.—Steel bar prices range all the way from 2.35c, Pittsburgh, at which figure the Carnegie Steel Co. is taking care of its regular trade, to 3.50c, which some independents are getting. However, the latter price is exceptional, and prices obtained by independents generally range from 2.50c to 3.25c. These prices by no means represent what a buyer would have to pay, but simply the levels at which mills are taking care of customers. Makers continue turning away big tonnages and are accepting only what is absolutely necessary. Following heavy specifying on last quarter contracts before the turn of the year, the demand for bolts, nuts and rivets continues quiet. Some more first quarter contracts have been entered mostly on the new basis of 40 off the list for large machine bolts, but certain large makers who did not participate in the advance on Nov. 28 still are quoting 45 and 5 off on large machine bolts, and have done large first quarter business on this basis.

Supply Situation Still Taut

Pittsburgh, Jan. 6.—With a shortage of gas restricting the supply of billets merchant bar mills operations are not as heavy as they otherwise might be, and lacking anything like normal bar supplies, makers of cold finished steel bars still are operating only in a limited way. The shortage of cold finished bars is still acute, and early tonnages, especially of bessemer screw stock, are practically unobtainable except at large premiums over the old base of 3.60c, Pittsburgh. Business has been done at 4.05c and intimations of even higher prices are heard, for prompt demand is heavy and supplies extremely limited.

Iron Bars Again Advance

Pittsburgh, Jan. 6.—Another advance, this time of $5 per ton, has been made by leading makers of iron bars in this district, carrying the market to a base of 3.75c, Pittsburgh, for common bars and 4.00c for refined. Demands for steel bars are as heavy as ever, with all makers sold well into the second quarter of the year. Another factor in the advance is the strength of the pig iron and scrap markets, while labor costs have gone up in keeping with the higher sales prices. The market on merchant steel bars is now quotable on the 3.00c base, Pittsburgh, as the companies holding to the old March 21 base either are not taking new business at present or, as is the case with the Carnegie Steel Co., are sold through the first half, and are unable to make early delivery. Forging steel bars have sold as high as 3.50c, and some makers are seeking even more. Bar mill activities have been somewhat restricted lately through the scarcity of steel, resulting from a gas for steel works use. Reducing the backlog of old orders consequently has been slow work.

Bolt Mills Run Fuller

Chicago, Jan. 6.—Manufacturers of bolts and nuts continue to find raw material fairly scarce, but this situation is being improved in some instances and the tonnage is being increased thereby. Inquiry and buying continue heavy and all consumers appear anxious to cover for further tonnages, most sellers being unable to entertain the business.

Ferro Market Advances

New York, Jan. 5.—A large importer of ferromanganese has sold about 5000 tons of English 76 to 80 per cent metal at $125 and $130, c.i.f. tidewater, during the past week for delivery over March, April, May and June. After booking this business, this interest raised its price to $140 tidewater, and already has made sales of several hundred tons at the new figure. During the past week another importer sold about 1000 tons of English metal at $130 tidewater, for 76 to 80 per cent metal for second quarter, but now is out of the market. During the past week, domestic makers have put up their price to $140 delivered, for 76 to 80 per cent for second half, and it is reported but not confirmed that some business has been done on this basis. Domestic makers recently disposed of all of their first half output on the basis of present production, although it is not unlikely that additional capacity may be put on this metal in the near future. In the latter case there probably will be some more to sell for first half. Buying of ferromanganese lately has been quite heavy. It is learned that one consumer alone in the Youngstown district bought 6000 tons. A fair amount of inquiry still is before the trade.

In spiegeleisen the principal inquiry is from abroad. One lot alone involves 5000 tons for shipment over the next five months, and it appears likely that this may be closed shortly. Domestic demand is not especially active although there has been some buying of late. It is believed that the minimum on 20 per cent now is $45 furnace. To such an extent has the stock of spiegeleisen which existed last year been liquidated, that there is practically no tonnage remaining, and so well sold up is the market that it has been difficult to place orders for carloads for January.

Ferromanganese Still Advancing

Pittsburgh, Jan. 6.—A rapid succession of advances has featured the market for ferromanganese in the past fortnight. First came the lifting of the domestic material to $130, delivered for 78 to 82 per cent; then the lowering of the guaranteed manganese content by two points and the retention of the $130 quotation, while this week a price of $140 has been named and some makers cannot take business for delivery before the third quarter. Meanwhile, English material sold last week at $125, c.i.f. tidewater, 1000 tons for second quarter delivery having gone at that figure. In the last few days $132 has been done, and this price now is regarded as the minimum. Sharply higher prices are believed to be in immediate prospect, due to the ore supply situation. The Brazilian government is reported to have imposed a heavy export duty on manganese ore and this has increased the cost to domestic smelters using this ore. One large interest having ore mines in Brazil is reported to have suspended operations and to have laid up its boats as a protest against the duty. Lack of boats seriously is hampering the Indian and Caucasion ores and supplies of domestic ores alone are insufficient. Production promises to be on a comparatively moderate scale for some time.

Spiegeleisen reflects the strength of ferromanganese, and is held firmly at $45, furnace, for 19 to 21 per cent. A large eastern smelting interest, making this alloy as a by-product is quoting $46.25, furnace, for prompt and first quarter and $51.50 for second quarter.

Not much activity is observed in 50 per cent ferrosilicon and while makers are talking $85, furnace, freight allowed, little business actually has been done above $80. One large maker recently took on a considerable tonnage on this basis.

Domestic Sold at $140

Philadelphia, Jan. 6.—A round tonnage of domestic ferromanganese, 76 to 80 per cent, has been sold at $140, delivered, for the second half, and this is now minimum price. While English ferromanganese, 76 to 80, sold at $140, tidewater, the price of $130 for the second quarter apparently has not yet disappeared. The old Locheil ferromanganese furnace blew in Jan. 1 on ferromanganese.

Ferromanganese is Stronger

Chicago, Jan. 6.—After a period of real weakness, the market for ferromanganese is coming back and quotations are advancing steadily. Domestic producers are out of the market for first half and only one has begun to book contracts for last half. This interest is selling 76 to 80 per cent at $140, delivered. The stack of the Miami Metals Co., at South Chicago, which has been idle for some time, is now producing 10 per cent ferrosilicon and will be returning to ferromanganese in a short time. It is not certain that this interest will continue producing the latter alloy far into the present year.

Steel Restricts Sheets

Insufficient Supply of Sheet Bars Keeps Down Production and Holds Market Tight—Conversion Orders Are Being Placed

Pittsburgh, Jan. 6.—A shortage of sheet bars now is the restrictive factor in the production of sheets and no progress worthy of note is being made in cutting down the live orders, which accumulated over the last quarter of last year as a result of the steel and coal strikes. The supply situation consequently remains extremely taut and little early tonnage can be obtained even at liberal premiums over the regular base prices. Small tonnages of galvanized sheets recently have been booked by independent makers above 7.00c, base, while bookings of black at 5.75c, base, and of blue annealed as high as 4.25c, base also have been made by some independent companies. These prices, in all instances have been made by the buyers rather than the sellers and illustrate how urgent are the requirements of some consumers. While all companies are looking out for their regular customers to the best of their ability at the old bases of 4.35c, for black, 5.70c for galvanized and 3.55c for blue annealed, the bulk of recent business in blue annealed has been at 4.00c, while new orders from irregular buyers in blacks have rarely been below 5.00c base, or in galvanized under 6.50c, base. One company which has taken no premium business has been helping out its customers needing extra tonnages during the first quarter by agreeing to take a tonnage of sheet bars and deliver an equal tonnage of finished sheets, minus the scrap, plus the conversion charge. It is understood that more than $50 has been paid for sheet bars by sheet consumers who have been taking advantage of this means of fortifying themselves on sheet supplies for the first quarter. Smallness of sheet bar production in this and the valley districts makes it necessary for the American Sheet & Tin Plate Co. to still draw on the west for supplies.

Many Orders Are Declined

Youngstown, O., Jan. 6.—Demand for all grades of sheets in this territory continues heavy. Inquiries for substantial tonnages are coming to Mahoning valley mills in large quantities but are being turned down in most every case. The mills here probably will continue their policy of refusing business until they catch up on their present orders. Buyers, nevertheless, are determined to get some attention paid to their sheet requirements. Finding that letters and telegrams have little effect along this line, they are calling on sheetmakers personally. The latter procedure, however, seems to have little weight, for the mills are turning down thousands of tons of sheets daily. Consumers, therefore, are turning to dealers and jobbers in hopes that they will be successful in locating enough material to do until the situation eases somewhat. Prices for any grade of sheets for spot shipment are of no consideration. Consumers will pay most any figure in order to get specifications accepted. A recent spot sale of about 75 tons of blue annealed in 10, 12 and 14 gages was made at 5.00c. Another case was heard where a buyer tried to place an order for 1000 tons of black at 6.00c and was unsuccessful in his efforts. The market is difficult to find but conservatively would fall around 6.50c for galvanized, 5.00c for black, and 4.15c for blue annealed.

Output Sold For First Quarter

Cleveland, Jan. 6.—The leading sheet maker in the Cleveland district has sold its entire output for the first quarter, and is not accepting new business, although inquiries continue to pour in from all parts. Inquiries for export and from automobile makers are particularly heavy and insistent. This maker has sold good tonnages of blue annealed sheets at 4.50c, and No. 28 black sheets at 6.00c.

Booked Beyond First Quarter

Philadelphia, Jan. 6.—The leading eastern sheetmaker has advanced its price to 4.30c, Pittsburgh, for No. 10 blue annealed. This interest is practically out of the market, and is taking only what is essential to take care of its customers. It is booked in excess of first quarter.

Sheet Bars Sell at $55

Pittsburgh, Jan. 6.—As high as $55 recently has been paid for sheet bars by sheet users in an effort to be protected against their requirements of finished product. Only by providing the semifinished steel has it been possible for these interests to secure a place on sheet manufacturers' books. Billets cannot be bought much below $50 for early shipment and the prompt market remains extremely strong on other forms of semifinished steel, due to the fact that production in this district has yielded somewhat to the fuel situation and a shortage of gas, while demands for early tonnages are stimulated by failure of finishing mills to obtain full shipments against contracts. Sales of soft wire rods continue to be made at $60 to $65 by independent makers, although the American Steel & Wire Co. is reported to be looking out for regular customers to some extent at the March 21 base of $52. Practically all makers of rods have more rod than finishing capacity in operation, but the nonintegrated manufacturers are free buyers and are absorbing practically all rods offered. Some export business in soft rods is reported to have been done above $70, Pittsburgh.

Offers High for Sheet Bars

Cleveland, Jan. 6.—Offers of $56 have bee nmade by buyers for sheet bars for January delivery, to producers in this district, but they have not been accommodated. The last transactions in sheet bars have been on the basis of $51, Youngstown and Pittsburgh, but these have been under closed arrangements. Small billets rolled from off-heats have been sold in this district at $47.50. The demand for sheet bars continues very intense as various consumers are finding that they cannot satisfy their full requirements with their regular sources of supply.

Strip Output Sold

Pittsburgh, Jan. 6.—Demands on makers of strip steel still are of big proportion and few of them now are in a position to accept much tonnage for shipment for some months. Automobile builders already have begun to shape their plans for the 1920-21 season, and these are understood to call for substantial increase over the output of the current season. The attempt by these interests to maintain production schedules for the present season, threatened by the light shipments of steel against contracts in the last quarter of last year, is reflected in big demand for early tonnages. While no concerted attempt is being made to advance prices premiums over the regular bases are reported on both hot and cold rolled steel. Manufacturers are watching their bookings closely and are limiting them to the same tonnages as buyers ordered for the last half of last year.

Structural Awards Many

New Lettings Reported Total 40,000 Tons—17,000-Ton Chicago Station to be Placed Soon—Steel Scarcity Blocks Work

Cleveland, Jan. 5.—Millions of dollars worth of structural work in the Cleveland district has been dammed up by the inability of some of the leading fabricators to guarantee delivery before four or five months, and the hesitancy of builders to place orders for delivery so far in the future. Predictions made last summer in regard to the demand and the inability of the mills to cope with it are being borne out. Representatives of large independent mills are refusing 3.00c a pound. As a consequence of the inability to obtain structural steel many large projects have been allowed to lapse, while others have been postponed. The contract for the Masonic temple, requiring 4000 tons, has been awarded to the National Iron & Wire Co., while the King Bridge Co. has taken 2000 tons for the Sheriff street market house. The Van Dorn Iron Works was awarded 1500 tons for the Film Exchange building. The city council has finally cleared away obstacles to the construction of the union depot, a project which will require approximately 100,000 tons of structural steel, and inquiries may be made on this business in the near future.

Round Tonnage is Placed

New York, Jan. 5.—One of the largest structural contracts here in recent weeks has just been consummated in the placing of 6000 tons for a 16-story office building on Fifth avenue, for the Textile Building Co., Inc. This is the first of several large jobs reported recently as likely to develop within the near future. The most sizable other contract reported during the past week involved a lot of 1500 tons for the American Industrial Bank & Trust Co., Hartford, Conn. The market as a whole at this time is rather quiet.

While mill prices are strong, and premiums are being asked in some instances on nearby shipments, such as may be available, the market generally remains unchanged, eastern mills still adhering to the 2.55c, Pittsburgh, base for shapes for delivery into this territory.

Eastern Mills Well Booked

Philadelphia, Jan. 6.—All shape mills in the East are now booked to an extent which makes them hesitate about taking more. They are taking only what they cannot avoid. Deliveries range all the way from two weeks to four months. A great deal of tonnage is being turned away, although the Carnegie Steel Co. continues taking care of its customers at 2.45c. The minimum for eastern mills is 2.55c, Pittsburgh. One mill is quoting 2.75c to 2.90c, mill. Another is quoting 2.75c, Pittsburgh, but is taking practically no business.

Premiums on Prompt Tonnages

Pittsburgh, Jan. 6.—While the leading interest continues to hold to a base of 2.45c for structural shapes, buyers complain that this quotation carries no guarantee of early or specified delivery, and that for tonnages wanted during the next 30 to 90 days when placed with independent mills the base price runs from 2.55c to 2.75c. All mills have considerable business backed up as a result of the decline in operations during the last quarter of last year, due to the labor and fuel situations, while the shortage of steel just now is preventing the mills from making much headway against the accumulated bookings. Possibility of a delay resulting from the congested conditions at the shape mills and of higher prices appears to be stimulating the placing of structural awards. The American Bridge Co. recently took 3000 tons for the buildings for the Libby-Owens Glass Machinery Co., Kanawha City, W. Va., while the McClintic-Marshall Co., among a number of other contracts, secured 3000 tons for the sheet mill extensions at the DeForrest plant of the Republic Iron & Steel Co., Niles, O.

West Continues Building

Chicago, Jan. 5.—Closing of structural contracts in western territory continues active and the past fortnight has seen some heavy tonnages booked. The largest business now in the market is the steel for the Union Station in Chicago, which will involve about 17,000 tons, bids on which were taken several weeks ago but which is held up apparently by the present uncertainty of control. An award on this tonnage is expected to come out at any time. The railroads are beginning to come out for sizable tonnages of bridge work and 3000 to 4000 tons of requirements of this character now are pending. Plain material is unchanged at 2.72c, Chicago mill.

CONTRACTS AWARDED

Municipal hospital, Buffalo, N. Y., 1200 tons, to Buffalo Structural Steel Co.

Lafayette high school, Buffalo, N. Y., 100 tons, to Buffalo Structural Steel Co.

Masonic temple, Cleveland, 4000 tons, awarded to National Iron & Wire Co.

Sheriff street market house, Cleveland, 2000 tons, awarded to King Bridge Co.

Film Exchange building, Cleveland, 1500 tons, awarded to Van Dorn Iron Works.

Plant for International Steel Tube Co., Cleveland, 500 tons, awarded to Steel Tie Co.

New foundry for Shaw Crane Works of Manning, Maxwell & Moore, Inc., at Muskegon, Mich., 1000 tons to Northwestern Bridge & Iron Co.

Stationary span at Prairie du Sac, Wis., 550 tons to Milwaukee Bridge Co. Kelly-Atkinson Const. Co., Chicago, general contractor.

Machine shop addition to new Milwaukee works of Nash Motors Co., Kenosha, Wis., 300 tons to Northwestern Bridge & Iron Co.

Paper mill addition for Nekoosa-Edwards Paper Co., Nekoosa, Wis., 100 tons to Northwestern Bridge & Iron Co.

Additions for Hubbard Steel Foundry Co. at East Chicago, Ind., 300 tons to Northwestern Bridge & Iron Co.

Wrigley building at Chicago, Ill., 3000 tons, to Bethlehem Steel Bridge Co.

Office building for building committee of the Medical Building association, of Omaha, Nebr., 1500 tons, to Paxton-Vierling.

Burgess-Nash building at Omaha, Nebr., 1200 tons, to Omaha Structural Steel Works.

Two 55,000-barrel oil tanks for Sinclair Oil Co., Tiverton, R. I., 410 tons, to McClintic-Marshall Co.

Additions to plant of the Steel & Tube Co. of America, Indiana Harbor, Ind., 1068 tons, to Worden-Allen Co.

Bag house and furnace building for the American Zinc, Lead & Smelting Co., Columbus, O., 311 tons, to Alliance Structural Co.

Building for the Schmidt Lithograph Co., San Francisco, 250 tons, to Dyer Bros.

Buildings for the West Virginia Glass Mfg. Co., West Huntington, W. Va., 146 tons, to American Bridge Co.

Manufacturing addition for Corn Products Refining Co., Pekin, Ill., 500 tons, to Milwaukee Bridge Co.

Factory extension for Felker Bros. Mfg. Co., Marshfield, Wis., 125 tons, to Northwestern Bridge & Iron Co.

Addition to Hastings, Mich., plant of E. W. Bliss Co., 165 tons, to Milwaukee Bridge Co.

Shop extensions for Wilcox Mfg. Co., Aurora, Ill., 162 tons, to Milwaukee Bridge Co.

Buildings for Libby-Owens Glass Machinery Co., Kanawha City, W. Va., 3000 tons, to the American Bridge Co.

Sheet mill extension for the Republic Iron & Steel Co., Niles, O., 3000 tons, to the McClintic-Marshall Co.

Press building for the Mullins Car Body Corp., Salem, O., 800 tons, for the McClintic-Marshall Co.

Ocean boulevard bridge, Long Beach, Cal., 600 tons, to the McClintic-Marshall Co.

Foundry building for Williams, White & Co., Moline, Ill., 850 tons, to McClintic-Marshall Co.

Seventh street bridge for Los Angeles Flood Control, Los Angeles, Cal., 266 tons, to Union Iron Works

Foundry building for the Chicago Malleable Castings Co., South Chicago, Ill., 120 tons, to Federal Bridge Co.

Anaheim bridge for Los Angeles Flood Control, Los Angeles, Cal., 190 tons, to independent shop.

Philosophy hall for University of Washington at Seattle, Wash., 106 tons, to Northwestern Bridge & Iron Co.

Helmhold Bowman bridge at Puyallup, Wash., 100 tons, to Illinois Steel Bridge Co.

CONTRACTS PENDING

Industrial building, South Bend, Ind., owner unknown, 600 tons, bids asked by Christman & Co., contractors.

Addition to plant of Fairbanks Morse & Co., Beloit, Wis., 8000 tons, bids asked.

Five 55,000-barrel oil tanks for the Midwest Refining Co., Casper, Wyo., bids asked.

Bridge material for Chicago, Burlington & Quincy railroad, 1000 tons, bids asked.

Bridges for Great Northern railroad, 2160 tons, bids asked.

Structural steel for girder span bridge across Wisconsin river at Prairie du Sac, Wis., 550 to 600 tons. Bids taken by Wisconsin State Highway commission.

Structural steel for three municipal dams for city of Wheeling, W. Va., 700 tons. Milwaukee Bridge Co. low bidder.

Addition to Old Colony Life Insurance building, Chicago, 900 tons, bids asked.

Building for Pennsylvania General Electric Co., Erie, Pa., 1000 tons; bids being taken.

Addition to shops of American Car & Foundry Co., Buffalo, N. Y., 1500 tons; bids being taken.

New Nail Card

Receives Attention of Producers—Margin Over Wire Held Too Low

Pittsburgh, Jan. 6.—Discussion of a new nail card is engaging the attention of the independent manufacturers of wire and wire products. Adoption of a card carrying a base price for nails allowing a wider margin over the price of plain wire or the establishment of extras that would insure profitable production of nails is considered possible. While the American Steel & Wire Co., in keeping with other subsidiaries of the United States Steel Corp., is likely to oppose any advance in prices at this time, it is pointed out that so long as the independent companies are dissatisfied with the present scales, they will not produce any more nails than they are obliged to, and early relief from the present acute shortage would be unlikely. Most of the independent companies today are getting at least $4, base, Pittsburgh, for nails and a number of them are quoting $4.25 and even higher on such tonnage as they have for sale. It is asserted that lower prices could be

named with the establishment of a new card placing nails on a base which in relation to the price of plain wire would allow a fair profit. This, it is claimed, does not exist with a spread of only $5 a ton between the price of wire and nails. Conversion of wire into nails costs most companies considerably more than $5, it is said, and in addition the keg costs about 25 cents. Such of the independent companies as are taking business are quoting $4 to $4.25, base, for nails, $3.50 for plain wire, $3.65 to $3.90 for painted barbed wire and $3.50 or more for coated nails.

Wire Production Larger

Chicago, Jan. 6.—While production of wire and nails is far short of demand, and orders are much delayed, betterment is being brought about in most mills and the tonnage turned out for shipment is increasing. However, shipments on contracts are much behind schedule and makers are unable to entertain more than a small part of inquiry presented them.

Output Being Restored

Cleveland, Jan. 6.—Output of wire products in this district is being restored more rapidly since more men are returning to the mills than at any time since the strike. Three of the five central blast furnaces of the American Steel & Wire Co. now are in operation. Production generally, however, is much below normal and new sales are extremely limited.

Many Rails Are Placed

Western Orders Finally Closed, in Excess of 400,000 Tons—Other Lots Closed—Track Fastenings in Demand

Chicago, Jan. 6.—Assurance that railroads will be returned to their owners March 1 has caused tentative contracts for standard steel rails to be executed completely and also has started a stream of orders for delivery, which enables the rail mills in this district to proceed with its rolling. The total tonnage closed by the Chicago producer is in excess of 400,000 tons, and covers the needs of most important western lines. There will be some further buying but contracts now closed cover the bulk of requirements. The local mill will start at once turning out rails as rapidly as possible, its limit being the supply of raw steel which can be apportioned to this department. Inquiry for and buying of track fastenings are active, and everything from bolts and spikes to splice bars and tie plates are being asked for in large tonnage, not only for laying the new rails, but also for repair work and care of secondary trackage.

An inquiry has been received for 3000 refrigerator cars for the Union Pacific railroad, which will require 21,000 tons of plates and shapes and 12,000 axles weighing about 4000 tons. This is the largest inquiry to come out in some time.

2000 Tank Cars Ordered

New York, Jan. 5.—The Texas Co. has placed orders for 2000 tank cars, 1000 with the General American Tank Car Co., and 1000 with the Pennsylvania Tank Car Co. The Pittsburgh & Lake Erie railroad is inquiring for 2000 tank cars.

Railroads More Interested

Pittsburgh, Jan. 6.—Although the railroads are not scheduled to go back to private management until March 1, the individual systems already are beginning to show considerable interest in track material. Important lines already have entered reservations for considerable tonnages of rails, and in the past week a number of them have put out inquiries for sizable lots of standard spikes. The New York Central lines, Baltimore & Ohio, the Seaboard Air Line and the Norfolk & Western railway are seeking spikes. Some makers now are quoting 3.50c for standard spikes in carload lots but basis still exists for a price of 3.35c, although the latter price is out of line with the current market on steel bars. Makers still have several weeks' business in sight in small spikes.

Rail Orders Are Placed

Cleveland, Jan. 6.—Some definite sales of rails for 1920 delivery now are being made in this territory. The Wheeling & Lake Erie has placed 4000 tons with the Carnegie Steel Co. on the $55 and $57, mill, basis. The Ann Arbor has closed for 5000 tons with the Lackawanna Steel Co., the price to be fixed at the time of delivery. The Nickel Plate has inquired for 7500 tons and the Clover Leaf is closing on 2500 tons.

The Nonferrous Metals

	‡Copper	Future Straits N. Y.*	†Lead New York basis	Zinc St. Louis basis	Aluminum	Spot antimony	Nickel ingot
Dec 31	19.125	60.00	7.50	8.90	33.00	9.75	42.00
Jan. 1	Holiday	.....	.....	.....	.....	.....	.....
Jan. 2	19.125	60.00	7.75	9.00	33.00	9.75	43.00
Jan. 5	19.25	64.50	8.00	9.37½	33.00	9.875	43.00
Jan. 6	19.375	64.50	8.00	9.47½	33.00	9.875	43.00

*Future shipment from Singapore or London.
†American Smelting & Refining Co.'s price.
‡Open market.

NEW YORK, Jan. 6.—Notwithstanding the holiday season, the nonferrous metal markets have been strong and active the past week. This market has paid considerable attention to London, where an apparent orgy of speculation has been indulged in. Tin, copper, lead and zinc have been advancing erratically at London and a broad export business has been possible, owing to fairly steady Sterling exchange rates.

The London tin market advanced £46 in December, but after New Years began to rise in earnest, jumping £5 to £6 on Dec. 2 and £16 to £17 on Dec. 5, a total of about £23 further, bringing the total advance from Dec. 1 to Jan. 5 about £69. This advance was equal, on the basis of current Sterling exchange rates, to about 12c a pound. The New York tin market, in the meantime, has advanced about 10c a pound since Dec. 1, Sterling exchange rates having declined about 20 points from Dec. 1 to Jan. 5. Straits tin was quoted 54.50c to 54.75c Dec. 1, according to position. The same grade was quoted 64c to 65c on Jan. 5, according to position. Scarcity of Straits tin in Singapore is indicated by private cables saying there are no sellers at 65c. The recent sharp advance in London is believed to be due to covering by speculators who sold short on the prolonged December rise.

The lead market has been advancing feverishly, despite the efforts of the leading producers to hold it back. The American Smelting & Refining Co. advanced its quotation Jan. 3 to 8c, New York, 7.75c, East St. Louis, this action following a similar advance of $5 a ton the previous day. The current quotation of the leading interest compares with a quotation of 5c May 15, since which time the market steadily has been rising. However, the leading producer is not a free seller at its published price and independent producers have been obtaining broad premiums. Pig lead sold Jan. 5 at 8.75c, New York, for February shipment, while some sellers asked 9c, New York. Apparently there is a world shortage of lead, due to lost production resulting from labor troubles in most of the principal producing centers of the world the past half year.

The copper market has been showing increased strength. December sales of electrolytic were among the largest ever done in a month, 500,000,000 pounds, including both export and domestic transactions. Japan bought from 35,000,000 to 40,000,000 pounds in December. France bought upwards of 20,000,000 pounds. Germany may have been the heaviest buyer but the amount is not given. England also was a buyer. The London copper market has been advancing steadily and at times recently this market seems to have taken its cue from London. Good consumers were able to buy first quarter delivery electrolytic copper at 19.25c on Jan. 5, but speculators were willing to pay 20c. Today the market was still a little stronger. Indications were that electrolytic would be selling at 20c to consumers within a few days. Casting copper sold in less than carload lots at 19c for first quarter and on Jan. 5 this price was asked for carloads. Lake copper was held at nominally 19.50c to 19.75c.

Brass prices are not yet changed but are expected to follow copper up soon. Lead and zinc sheets are up to 11.25c and 12c respectively.

Zinc has been climbing steadily. Some prime western was sold early Monday around 9.30c. East St. Louis, for prompt and first quarter shipment, but today it was 9.45c to 9.50c.

Antimony is stronger. Wholesale lots sold at 9.87½c; retail lots at 10c to 10.12½c.

Place Mill Contract

Contracts for the new building, which will house the eight additional sheet mills and four additional cold mills at the DeForest plant of the Republic Iron & Steel Co., Niles, O., have been let to the McClintic-Marshall Co., Pittsburgh. Approximately 4000 tons of steel will be required for the new building. The mills will be built by the United Engineering & Foundry Co., Pittsburgh, while the cranes will be furnished by the Alliance Machine Co., Alliance, O.

Award Stack Contract

A contract for enlarging the No. 2 stack at the plant of the Carnegie Steel Co., Farrell, Pa., has been awarded the Pennsylvania Engineering Works, New Castle, Pa. The present capacity of this furnace is 350 tons per 24 hours but when alterations are completed the stack is expected to produce 500 tons per 24 hours. Approximately $340,000 are involved in remodeling this unit.

Export Tonnage Still Falling Off

Volume of Inquiries, However, Continues to Hold Up Fairly Well, Despite Rising Costs—Canada Drawing British Business—Large Tonnages Purchased at Last Summer's Low Prices in United States Undelivered

NEW YORK, Jan. 5.—While the volume of export inquiries continues to hold up fairly well despite rising costs, the orders booked show a constant decrease in tonnage. Advancing prices apparently have nothing to do with this situation, but if the material could be found any amount of business would be placed. Exporters generally declare they are able to obtain almost every kind of material, but the tonnages they book are extremely small. A 50-ton order is considered worth while, and one for several thousand tons of material is looked upon as an event of considerable importance. Sheets are the most difficult to obtain, while some export houses say they cannot obtain wire or rods. A plate inquiry from the Far East went begging, although it was learned that a Canadian order for 6000 tons of ship plates was placed at 3.00c, Pittsburgh.

So long as this scarcity of material exists it is difficult to estimate the prices which prevail. Offers of plates have been entertained at prices varying from 2.90c to 3.17c. The price at which a commodity sold today may not be the price quoted a few hours hence. Much depends on the availability of the material, the probable date of shipment and the responsibility of the persons selling and buying. A shipment of 2500 kegs of nails was sold for export at $5.80. Barbed wire has been quoted at $5.50, although it is known that some sales have been consummated at slightly less. On one order for mild steel plates it is known that 4.47c was paid for 10-gage, 4.64½c for 12-gage, and 4.74½c for 14-gage. Steel pipe was quoted 42 per cent off English list, while black gas pipe was sold for 54 per cent off English list, based on an exchange of $4.80.

Exporters believe that present prices are here to stay and some are inclined to believe that they will go higher. On the other hand, one or two traders declare the peak of high prices has been reached. They anticipate that consumers will refuse to pay any more for American iron and steel, and that advancing costs will curtail foreign sales.

The only thing which can bring a change in the export market apparently is an increased supply of material. Exporters are constrained to adopt heroic measures to tide themselves over this situation. Some houses have been willing to cut their own profits in order to make a showing for the month. The United States Steel Corp. is not quoting to the exporters. The Consolidated Steel Co. has carried small amounts for particular customers but only for certain specific lines, such as rolled products, including rails, car-wheels and the like. Exporters have been informed that the Consolidated company will not be in a position to quote before the latter part of February or the first of March. One independent mill has declared that it will not be ready to quote again before next June.

Freight Rates Greatly Increased

According to the railroad returns the freight deliveries at the North Atlantic ports increased 264 per cent during the week ended Dec. 24, in comparison with the same week the year previous, and the deliveries to ship increased 318 per cent. Little of the export movement today is iron and steel. Steamship companies are reputed to be feeling this, as they are anxious to carry a certain amount of heavy freight for ballast. Taking advantage of the small outgoing movement of steel, one exporter was able to break the steamship freight quotation from $10 to $8 per ton on movements out of South Atlantic ports to the United Kingdom. Now it is said the freight on this material to the Mediterranean ports is due for a reduction of about 25 cents per 100 pounds.

Complaint is being heard in regard to the sustitution of tonnages. When the stringency in production started the mills were carrying on their books a great volume of foreign orders which were placed during last summer when prices were down. Since then they have booked new orders at premium. It is claimed that some mills are delivering on the later orders and delaying shipment on the former.

England still seems anxious to purchase over here and now and then a small tonnage is placed. Canada, however, is drawing English business. One of the most recent British inquiries was for 2000 tons of billets, the business ultimately going to Canada. England has also inquired for 1000 tons of tank plates and 3000 tons of Lloyd's ship plates.

Through English connections, an American exporter has taken an order from Australia for 400 tons of mild steel plates, and an order from India for 15,000 feet of pipe. It is reported that trading with Germany is rapidly increasing, but despite this prices in Europe have not fallen. Iron and steel prices in England, on the other hand, have advanced. The English have met with little success in attempting to fill their requirements for semifinished material on the continent and English agents in this market acknowledge that during the next year at least England must purchase heavy and semifinished material on this side.

The American Car & Foundry Co. has booked an order from Spain for 50 passenger cars to cost $1,000,000. This company has determined against the proposed plan to build an assembly plant in Belgium. A further sale of locomotives and cars to Belgium is pending.

Trade with Europe is on the point of a great transition. During the past week the house of J. P. Morgan & Co., announced the formation of the Foreign Commerce Corp. of America. These international bankers a short time ago organized the Foreign Finance Corp. of America. The latter will deal in foreign securities whereas the new organization will be a mercantile proposition. Inasmuch as the Morgan house was the chief fiscal agent of the allies during the war this announcement carried much food for conjecture. It is rumored that the Morgan group intends to aid the peoples of central Europe.

Japanese agents in this country are now giving their chief attention to obtaining deliveries on their orders. Unofficially it is estimated that American producers have carried over some 1,000,000 tons of material which foreigners ordered during 1919. The total exports to all countries actually moving out of the country during the past year will be approximately 4,500,000 tons.

British Freight Rates Advanced

New Iron and Steel Prices to be Announced After Higher Rates Go in Effect Jan. 15—Pig Iron May be Increased $3.78 a Ton—Molders Strike Settled —France to Buy Material From Germany

The Iron Trade Review Staff Cable

European Headquarters,
THE IRON TRADE REVIEW,
16 Regent St., S. W. I.,

Sterling—$3.78

LONDON, Jan. 5.—Just what the new iron and steel prices will be as a consequence of increases of from 25 to 100 per cent in railroad freight rates announced to become effective Jan. 15 has not been determined. Meanwhile new business is held in abeyance. Pig iron may be advanced £1 ($3.78). The freight rate on Spanish ore shipped to Middlesborough is now 27s ($5.10).

Steelworks are just resuming operations following the holidays. Meanwhile specifications have accumulated, making the position of buyers of semi-finished material more difficult. Practically no billets are to be had under £17 ($64.26).

The tin plate market is feverish, sales being made at £2 10s ($9.45) or 1s (18 cents) above the previous record price in 1872. American tin plate is still too high to compete with British plate, despite the advance in Welsh plate, on account of the exchange rate. Two hundred and fifty tons of Straits tin were sold recently at £328 ($1239.84) per ton, c.i.f. English tin ingots have advanced to £341 ($1288.98). The situation in regard to galvanized sheets is similar to that of tin plate. Sales of corrugated sheets are being made at £45 ($170.10).

The molders' strike has been settled subject to ballot among the men. The union was beaten, accepting an arbitration award of 5s (95 cents) instead of 15s ($2.85) for which it struck. The situation has been greatly relieved, although the foundries probably will not resume for a fortnight.

The speech of Finance Minister Klotz, of France, in Paris, Jan. 1, in which he said France must look to Germany for finished iron and steel and other metals and machinery created a profound impression in business circles here. Minister Klotz said:

"It is necessary to import from Germany, Austria and Jugoslavia whenever exchange is favorable. There is no reason why France should purchase American or British goods at high prices when German goods are procurable on favorable terms."

Prices of Semifinished Material Still Rising

Office of THE IRON TRADE REVIEW,
Prince's Chambers, Corporation St.,
Birmingham, Eng., Dec. 19.

Sterling—$3.80

THE announcement that railway rates are to be increased about 50 per cent Jan. 15 was anticipated, although no formal advance has been made in the price of pig iron. Makers are not in a hurry to revise prices, as they are quite satisfied with their contracts which protect them against losses from higher railway rates or other increased costs. At the same time everyone recognizes the fact that new prices must be fixed, if only to satisfy the consumer, who is dissatisfied with an arrangement which requires him to take all the risks. The buyer can contract for pig iron, but nobody can tell him what he will have to pay for it, and the manufacturer is equally in the dark. There will be higher rates on ore, coal, coke, limestone, and on everything else that is carried by rail. In Cleveland there is a general agreement to sell as little as possible until the situation is clearer, and little iron is being sold for delivery in 1920. It is anticipated, however, than an advance of probably £1 ($3.80) per ton will be made in Cleveland and Midland irons.

The hope at the beginning of the week that the molders' strike was near a settlement stimulated the demand for foundry material which was already strong, but in the Midlands sellers are cutting down all offered contracts in view of their inability to meet the large demand. The car shortage continues to place the most serious obstacles in the way of production. The Middlesborough exports show an improvement, but this is illusory, the explanation being that owing to the railway chaos, the Scotch buyers are having their iron sent to them by ship instead of rail.

The threatened strike in the Barrow district has been averted and the hematite furnaces still remaining in operation have managed to continue, although with difficulty. The West Coast Ironmasters' association and the Cumberland and Lancashire Federation of Blastfurnacemen have agreed on a new sliding scale which merges the new war bonus and increases wages. The inevitable result must be a further rise in the price of West Coast hematite pig iron. The iron ore output in that district is unsatisfactory, principally on account of a strike, which has stopped the operation of three mines.

The Birmingham iron market yester-

Current British Prices

In Pounds, Shillings, Pence
At Works

	Home consumption	Export prices
SEMIFINISHED STEEL		
Billets, soft steel	17:0:0 to 17:10:0	17:0:0*
Sheet bars	17:0:0	17:0:0*
FINISHED STEEL		
Steel bars, England, ⅝ to 3 inch	21:15:0	21:15:0*
Ship plates, England	21:10:0	21:0:0*
Ship plates, Scotland	21:0:0	21:0:0*
Beams, England	18:5:0	18:5:0*
Beams, Scotland	18:5:0	18:5:0*
Sheets, black, 24 gage	29:0:0	28:0:0*
Sheets, galvanized, 24 gage	40:02:0	40:2:0*
Rails, 60 lbs. and over	17:10:0	17:10:0*
Tinplate, base box, 108 lbs.	2:12:0	2:12:0*
*Export steel prices are nominal.		
PIG IRON		
Hematite, East Coast Mixed Numbers	10:0:0	10:5:0
Hematite, Scotch	10:10:0	10:15:0
Middlesborough Basic	8:5:0	8:10:0
Middlesborough No. 3	8:0:0	8:5:0
No. 3 Foundry, Derby, Leicester, Nottingham	9:5:0	9:10:0
No. 3 Foundry, Northamptonshire	8:12:6	8:17:6
No. 3 Foundry, Staffordshire	9:12:6	9:17:6
Scotch Foundry	9:15:0	10:0:0
Ferromanganese, 80 per cent	27:0:0	27:5:0
COKE		
Midlands furnace	2:10:6	.....
Midlands foundry	3:6:0	.....

day was one of the most active of the year.

Local ironmasters have put up the prices of all finished iron 10s ($1.90) per ton, and have made the advance applicable to all orders in hand. The advance is "to provide for the increased cost due to the recent advance of wages under the sliding scale." This raises the price for unmarked bars to £23 ($86.40) while marked bars, a higher grade of iron used mainly for cables, and other shipbuilding work, becomes £25 10s ($96.90).

Sheet makers were off the market, having sold their output of galvanized sheets practically over the next three months at prices ranging between £37 10s ($1.27.85) and £39 ($134.20).

Like finished iron, steel is gradually commanding better prices. While £20 15s ($78.85) is the recognized price of steel bars manufacturers say that sales are usually at prices ranging from £1 ($3.80) to £1 5s ($4.75) above this figure for such material as ¾-inch to 1-inch round and square bars. It is steel is now coming in, although a day or two ago a Birmingham merchant was informed by some large Canadian steelmakers that they could supply any quantity within a wide range of products. Nothing was said about terms and the merchant promptly sent out a list of steels wanted on which he invited Canadian quotations. For high grade billets, known as carbons, £17 10s ($65.50) is charged, while £17 ($64.60) is asked for "dead soft," and £16 10s ($62.70) for ordinary.

The South Wales boom in tin plate has increased in volume, inquiries pouring in from all parts of the world. Welsh tin plate has been sold this week at 48s 6d ($9.02) f.o.b. for delivery during the first three months of the year. There is a great demand for oil sizes, owing to the inability of America to deal with this branch of the trade. It was reported on the London exchange the other day that the United States had entered the market as an inquirer for sheets running up to £250,000 ($950,000) in value. There is not much probability that this business will be accepted in view of the scarcity of labor and material and the congested state of the mills. As much as £42 ($139.60) has been paid for 24-gage galvanized sheets f.o.b.

Advance Freight Rates

Effective Jan. 1 the freight rate on finished steel materials from Pittsburgh to Philadelphia was advanced from 24½ to 25 cents per 100 pounds. The rate on semifinished material was advanced from $4 to $4.10.

Electric Steels

Will be Produced and Rolled by New Youngstown Company

Neither the negotiations for the site nor for the type of furnaces have been closed by the Electric Alloy Steel Co. which will erect an electric steel plant in the Youngstown district for the purpose of manufacturing high speed alloy steel. The incorporators are James A. Campbell, president, and Louis J. Campbell, vice president, both of the Youngstown Sheet & Tube Co.; A. E. Adams, banker; L. A. Manchester, general counsel, Youngstown Sheet & Tube Co.; and Cecil D. Hine, attorney. Louis J. Campbell resigned Jan. 1 from the Youngstown Sheet & Tube Co. and expects to devote his time to the new company. The new plant will include two electric furnaces of large capacity, a 10 and 16-inch bar mill and a 500-ton forging hammer. The company will specialize in the manufacture of vanadium, chrome and nickel steels. Expectations are that the plant will be in operation by July the first.

According to the incorporators the proposed plant will cost about $1,000,000. It will be built under the direct supervision of Barton R. Shover, designer of the Brier Hill Steel Co.'s plant and will be located in the manufacturing district west of Youngstown.

The company has an authorized capital of $1,500,000 consisting of 15,000 shares of a par value of $100. No preferred stock will be issued.

O. R. Hamilton to Value Iron Ore Properties

O. R. Hamilton, assistant appraiser of mines for Michigan, has been appointed engineer in charge of valuation of iron ore properties, division of mineral resources, bureau of internal revenue. After graduating at the Michigan College of Mines in 1906 with the degree of engineer of mines, Mr. Hamilton was employed by the firm of MacNutt & Vigeon in Chile, South America, then by the Cerro de Pasco Copper Co., in Peru and by the late Col. Eugene Zimmerman, in Cuba.

On his return to the states, Mr. Hamilton joined the engineering staff of Pickands, Mather & Co., and was engaged with that organization for two years in the company's mining operations in Michigan. He became chief engineer for the Spring Valley Iron Co., in 1911 and in that capacity planned the installation of the plant and development of the Zimmerman mine. In 1912 he was engaged in private practice in Iron River, Mich., and on Jan. 1, 1913, he was employed as assistant appraiser of mines for Michigan by Dr. R. C. Allen, then appraiser of mines and state geologist for Michigan, and who recently was elected vice president of the Lake Superior Iron Ore association.

Mr. Hamilton was commissioned as a volunteer captain of engineers in 1916 and served in France throughout the war, returning to his office at Lansing, Mich., June 20, 1919.

Sell Billets at $50

Philadelphia, Jan. 6.—Considerable business in semifinished was done during the past week. Fifteen hundred to 2000 tons of rerolling billets were sold at $50, Pittsburgh, but some carried a price of $60. About 6000 tons of forging billets were sold. Twenty-five hundred tons went at $65, Pittsburgh, and 3500 at $67.50. A considerable tonnage of wire rods was sold by the American Steel & Wire Co. at $52, Pittsburgh, and by independent at $60.

Places Equipment Orders

Contracts for cranes and other equipment for its new structural and rail plant have been awarded by the Algoma Steel Corp., Ltd., Sault Ste. Marie, Ont. The Morgan Engineering Co., Alliance, O., was awarded 16 cranes as well as the structural and rail mills; mill and crane motors went to the Canadian Westinghouse Co., and the Mesta Machine Co., Pittsburgh, received the order for the blooming mill equipment.

To Sell Direct

Buffalo, Jan. 6.—The Wickwire Steel Co. has discontinued its arrangements with B. Nicoll & Co., New York, whereby the New York company sold its pig iron, and hereafter will sell its iron through its own offices. According to T. H. Wickwire, this is the logical result of the growth of the Wickwire sales organization from a position where it began to handle the products of the company's mills until it was able to take over the pig iron business. Sales offices will be maintained in Buffalo and New York.

The blast furnace of the Stewart Iron Co., Sharon, Pa., idle since the strike of iron and steel plant workmen, went into blast Jan. 2.

Fig. 1—General view of plant of American Steel Co., Palatino, near Havana. The open end is the receiving department, an interior view of which is shown in Fig. 3

Fabricating Steel in Isle of Cuba

Modern Shop at Hacendados, Near Havana, Has Capacity of 1000 Tons of Finished Shapes Per Month—New Plant at Palatino Has Annual Output of 2000 Steel Frame Railroad Cars

BY JOHN P. RISQUE

Staff Correspondent of The Iron Trade Review

IF CUBAN building contractors were held strictly to the terms of the provisions of an ancient Havana city ordinance which limits the height of a building to one and a half times the width of the street upon which it is to be built, Havana today still would be planning single story edifices right in the heart of the financial district. Many of the streets are considered wide if they exceed 20 feet; as a matter of fact, Obispo, probably the most luxurious thoroughfare in the city, is about 12 feet wide. Luckily, however, special permission is obtained to ignore the restrictions of this antiquated decree and the result has been extremely gratifying to the city, contractors and fabricators of steel.

Generally speaking, ordinary two or three-story buildings are constructed of brick, stone or reinforced concrete. For everything over three stories, steel skeleton construction is employed. Many seven and eight-story buildings have been erected in Havana in the last two years, more are planned and others will be built, perhaps higher, as Havana gradually gets used to "sky scrapers."

Steel Fast Supplanting Other Material

When it is considered that other restrictions imposed upon city builders by well intentioned but oldfashioned framers of the laws, require heights of ceilings which are unfamiliar to engineers of the United States, it is easy to understand why Cuban contractors turn to steel when their plans reveal possibilities of going higher than the traditional three stories. First floors are required to be 18 feet from floor to ceiling; second floors, 16½ feet, third floors, 14½ feet; and reducing on up to a specified minimum of 12 feet. Thus an 8-story American building would be comparable to a Cuban building of only six stories as far as height is concerned. Massive walls, heavy doors and tile floors all contribute their extra share toward encouraging the use of the best obtainable framework. In spite of recent high prices asked for it, steel is gradually supplanting other materials for this purpose. The largest steel framework erected for a building in Havana is that of the Talla Piedra power house of the Havana Electric

FIG. 2—AN INTERIOR VIEW OF THE CONSTRUCTION SHOP OF THE CAR BUILDING PLANT. NOTE THE HOIST SUSPENDED FROM TRAVELING CRANE AT THE RIGHT

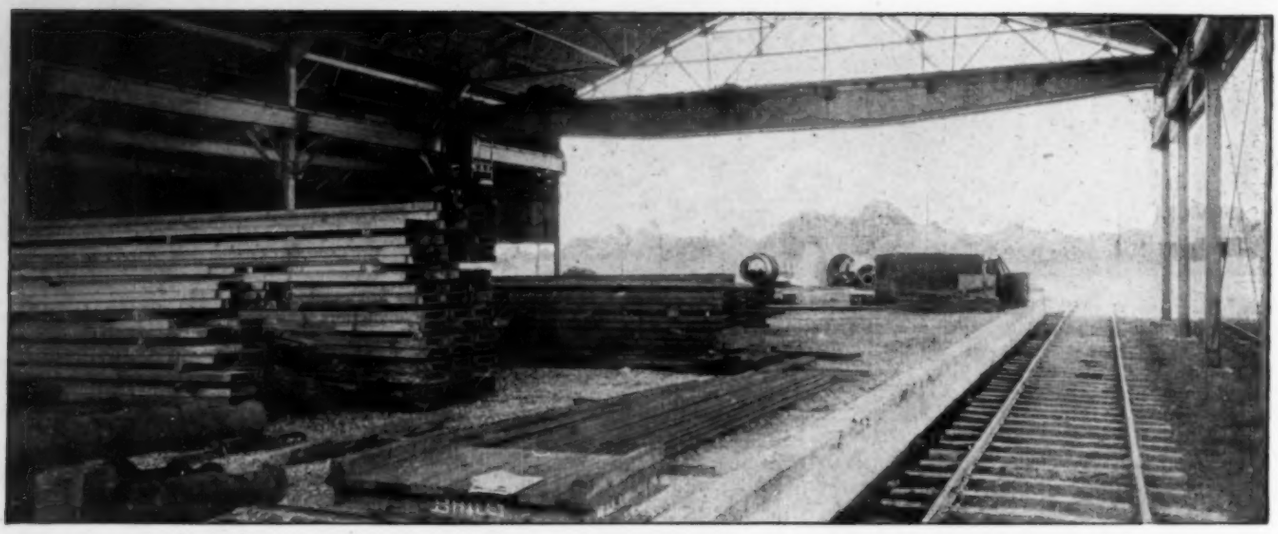

FIG. 3—INTERIOR OF FIRST BAY OF RECEIVING DEPARTMENT OF THE STEEL CAR ERECTING SHOP

Railway Co. It was fabricated by the American Steel Co. of Cuba and contains 2500 tons of metal. Another building containing 1500 tons of steel, also fabricated at the plant of the company mentioned, is the National Theater building. Important additions for the Barraqué building, one of the most modern office buildings in Havana, and the National Bank of Cuba building are in progress of construction. The aforementioned statements are given merely to convey the idea that structural steel for buildings, for the first time in a century of stone, occupies a prominent place in the minds of the builders of one of the largest and most important cities in Latin America.

That the possibilities in this field are not being overlooked, is attested by the activity of import agents for well known American steel concerns. Probably the most constructive step, however, toward meeting and fulfilling the then clearly foreseen demand for steel of all varieties and shapes in Cuba, was the organization in 1908 of the American Steel Co. of Cuba, a local concern which started out to fabricate steel for bridges and buildings at Hacendados, near Havana. Two years later a battery of four bolt forging and rivet making machines were added, as well as a nut forging equipment. This part of the plant is now turning out 300 tons of finished nuts, bolts and forged rivets per month. The Hacendados structural shop is at present capable of turning out 1000 tons of finished shapes a month and stocks of from 5000 to 10,000 tons of steel are carried in the warehouse, which comprises three bays, 50 x 300 feet. Each is adequately served by cranes, an extension of the railroad switch and a pier where steamer loads of steel can be economically unloaded. An important part of the product of this plant goes to the erection of sugar mills and sugar storage warehouses. The island sorely feels the lack of sugar storing facilities. The coming sugar crop, conceded to be worth in the neighborhood of $500,000,000 will require the carrying out of an expensive building program. For this reason it is predicted that steel purchases will be large.

In 1914 the company began to sense the importance of producing steel railway cars along with its structural steel products. It purchased 20 acres of ground at Palatino, a suburb of Havana on the Western Railway of

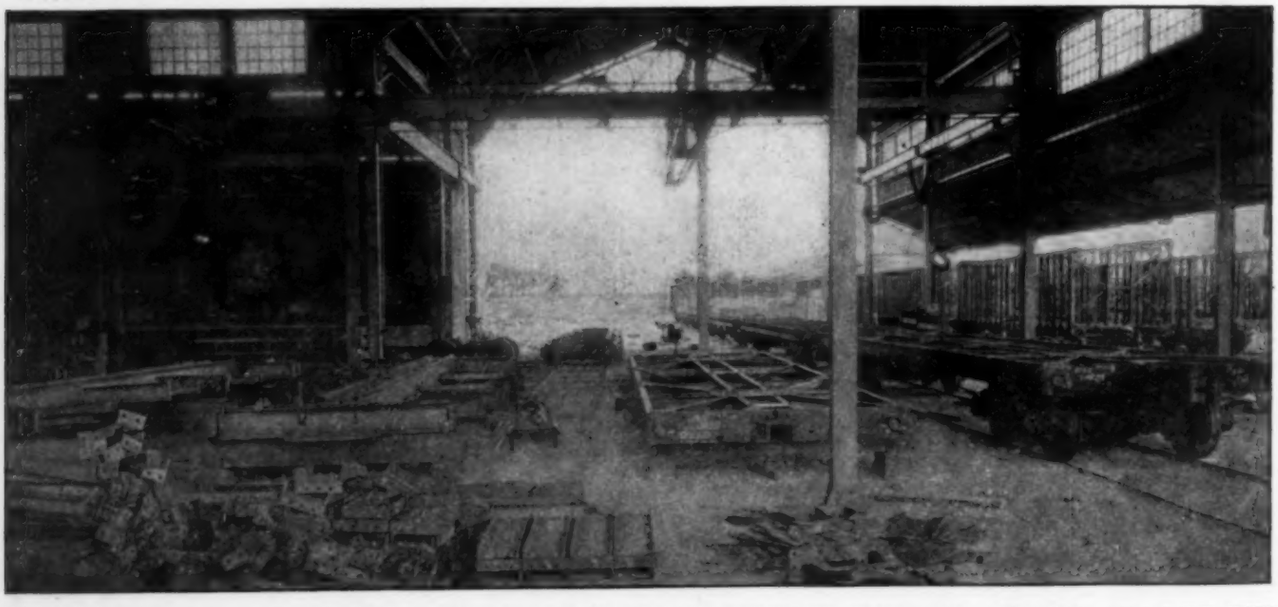

FIG. 4—ASSEMBLING END OF THE CONSTRUCTION SHOP. RIVETED PARTS FOR CAR FRAMES ARE SHOWN IN THE FOREGROUND AND AT THE RIGHT ARE ASSEMBLED CAR FRAMES. COMPLETED CANE CARS ARE SHOWN OUTSIDE THE BUILDING AT THE RIGHT

Havana. A receiving building, 75 x 125 feet, was constructed for unloading and storing steel, axles, wheels and miscellaneous parts. These are conveyed by means of electric cranes to respective sorting floors in two adjacent bays of the same building, each 50 x 125 feet. Adjoining the receiving building is a construction shop 150 feet wide by 300 feet long. The shop is divided into three departments one of which is devoted to the fabrication of car frames. Apparatus for building and equipping trucks occupies a second department and a forging shop for producing rod ends, etc., constitutes the the third department. An erecting shop, 50 x 150 feet, adjoins the construction shop and a complete woodworking and a paint shop are included in the list of auxiliary buildings. The annual output of the entire plant is 2000 cars, including steel framed box cars, flats and the familiar steel cane cars of various types which fast are supplanting the old wooden cane cars.

May Build Wheel Foundry

Wheels now are brought in from the United States, but the company is planning to make its own wheels in a foundry building which it is contemplated may be erected during the coming year. The building, as proposed, will have a floor area of 120 x 375 feet and one end will be used as a steel foundry. The receiving buildings and storehouses are to be tripled in size. Further expansion, which will be made to assist in maintaining cars at this end of the island, includes extensive rip-track facilities with transfer table.

It is conceded that in spite of the preparations being made for handling a large business, the steel industry in Cuba is in its infancy. The principal energies of the American Steel Co. now are devoted to keeping up with the demand.

Roumanian Transmits Power by Waves

According to the *London Times*, George Constantinesco, a Roumanian engineer, has invented and patented a novel method of transmitting power. The new system depends on the well known physical fact that waves are propagated through a liquid without actual translation of the liquid itself.

In the Constantinesco apparatus water is the liquid found most convenient. In its simplest form the apparatus may be described as a pair of cylinders the lower ends of which are connected by a closed tube. Each cylinder has a plunger or piston, the one connected with the source of power, the other with the apparatus to which power is to be conveyed. The system is filled with water, and the plunger at the power end is rapidly moved up and down. At each downward stroke it conveys a shock to the water, which is propagated as a wave along the tube, and conveys an upward shock to the plunger at the receiver end. As there is no translation of water, no constant supply is required, and as power is conveyed by a rapid succession of shocks, there is never a dangerous pressure. In one application of this principle, the plant consists of three cylinders at each end, each pair with a conveying pipe, the cranks of the pistons being set at an angle of 120 degrees to their crankshafts. It is claimed the ordinary wrought iron steam pipe 1 inch in diameter will convey approximately 10 horsepower for moderate distances with high efficiency, and that by the use of hydraulic pipe of the same bore the energy transmitted may be increased several hundred per cent.

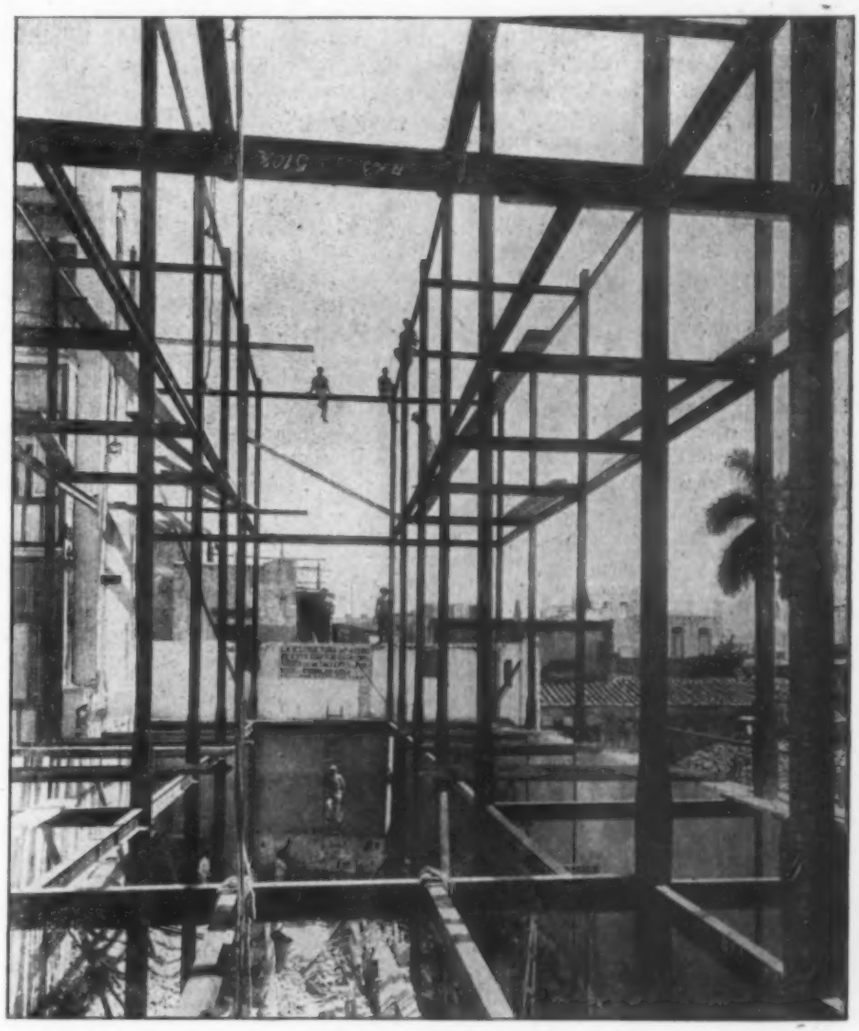

FIG. 5—A MODERN STEEL BUILDING RISING IN THE MIDST OF SOME OF HAVANA'S CENTURY-OLD STRUCTURES

Offers Prizes for Papers

As an inducement to industrial plant managers, engineers and others to study interdepartment transportation problems three awards for the three best analyses of the application of its new tier truck are offered by the Lakewood Engineering Co., Cleveland. The prizes, consisting of $1000, $500 and $250, respectively, will be awarded by a committee appointed by the Society of Industrial Engineers, consisting of A. Russell Bond, chairman, editor, *Scientific American Supplement*, New York; Prof. Dexter S. Kimball, dean, school of engineering, Cornell university, Ithaca, N. Y.; and Irving A. Berndt, vice president, C. E. Knoeppel & Co., New York. All papers must be in the hands of Mr. Bond by Jan. 30, 1920.

Manufacturing High-Speed Steel

Chemical Analysis is Not Sole Important Criterion of Quality of Tool Steel—Working of Steel From Ingot Form to Finished Product Requires Highest Degree of Skill and Knowledge

BY ROY C. McKENNA

HIGH-SPEED steel is one of the most complex, complicated alloys known. A representative high-speed steel contains approximately 24 per cent of alloying metals, including tungsten, chromium, vanadium, silicon, manganese, and in addition there is often found cobalt, molybdenum, uranium, nickel, tin, copper and arsenic.

The selection of a standard analysis by the manufacturer is the result of a series of compromises between various properties imparted to the steel by the addition of different elements. There is a wide range of chemical analysis of various brands of high-speed steel. All will agree that although there are being manufactured as high-speed steel, brands that do not come within the standard of what is commercially known as high-speed steel, there are certain well defined limits to the contents of certain elements.

Effects of Tungsten and Chromium

The combined action of tungsten and chromium in steel gives to it the remarkable property of maintaining its cutting edge at relatively high temperature. This property is commonly spoken of as "red-hardness." The percentage of tungsten and chromium present should bear a definite relationship to each other. Chromium imparts to steel a hardening property similar to that given by carbon, although to a less degree. The hardness imparted to steel by chromium is accompanied by brittleness. The chromium content should be between 3.5 and 5 per cent.

Vanadium was first introduced in high-speed steel as a "scavenger," thereby producing a more homogeneous product, of greater density and physical strength. It soon became evident that vanadium used in larger quantities than necessary as a scavenger, imparted to high-speed steel a much greater cutting efficiency. A range from 0.5 to 1.5 per cent in vanadium content in high speed steel is permissible.

An ideal analysis for high-speed steel containing 18 per cent tungsten is a chromium content of approximately 3.85 per cent, vanadium 0.85 per cent to 1.10 per cent, and carbon between 0.62 and 0.77 per cent.

Sulphur and phosphorus are two elements known to be detrimental to all steels. Sulphur causes "red-shortness" and phosphorus causes "cold-shortness." The detrimental effect of these two elements counteract each other to some extent but the content should be not over 0.02 sulphur and 0.025 phosphorus. The serious detrimental effect of small quantities of sulphur and phosphorus is due to their not being uniformly distributed, owing to their tendency to segregate.

The content of manganese and silicon are relatively unimportant in the percentage usually found in high-speed steel.

The detrimental effects of tin, copper and arsenic are not generally realized by the trade. Small quantities of these impurities are exceedingly harmful. These elements are very seldom determined in customers' chemical laboratories and are somewhat difficult for public chemists to analyze.

In justice to the manufacturer of high-speed steel, attention should be called to the variation in chemical analyses between the best of laboratories. Generally speaking, a steel works laboratory will obtain results much nearer true and accurate than is possible by a customer's laboratory, or public chemist. This can reasonably be expected for the steel works' chemist is a specialist, analyzing the same material for the same elements day in and day out.

The importance of the chemical laboratory to a tool steel plant cannot be overestimated. Every heat of steel is analyzed for each element, and check analyses obtained; also, every substance used in the mix is analyzed for all impurities. The importance of using pure base materials is known to all manufacturers despite chemical evidence that certain detrimental elements are removed in the process of manufacture.

The chemical composition of steel for any purpose is a basic consideration and must be such as will meet the requirements, but the quality of the steel does not depend wholly upon the chemical composition. Assuming the chemical composition to be within the permissible limits, the quality depends upon local conditions surrounding its manufacture. If the quality of steel were entirely dependent upon the chemical composition and not influenced by its working and handling in accordance with tool steel practice, the tool steel industry would be unable to exist.

The manufacture of high-speed steel represents the highest art in the making of steel by tool steel practice. Some may say, on account of our increased knowledge of chemistry and metallurgy that the making of high-speed steel has ceased to be an art, but has become a science. It is, in fact, an art; aided by science. The human element in the manufacture of high-speed steel is a decided factor, as will be brought out in the following remarks.

Modern Practice

The manufacture of high-speed steel begins with the selection of the raw materials which enter into the mix. Reference has already been made to the care taken by having a chemical determination made of all impurities likely to be present in ferroalloys and also the fact that in order to make a good product, a good low-phosphorus melting iron must be used as the base.

The heat treatment of steel in its broad aspect may be said to commence with the melting furnace and end with the hardening and tempering of the finished product. High-speed steel is melted by two general types of furnaces, known as crucible and electric; the process of operation and construction of which have been frequently described.

High-speed steel must be of correct chemical analysis, properly melted and cast into solid ingots, free from blowholes and surface defects. Sudden changes of temperature in high-speed steel are to be guarded against at every stage of its manufacture and subsequent treatment. Ingots of high-speed steel are relatively weak, and the tendency to crack, due to cooling strains, is great. For this reason the hot ingots are not allowed to cool quickly, but are placed in furnaces which are of about the same temperature and are allowed to cool

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From a paper presented at the last annual meeting of the American Steel Treaters' society, Chicago. The author, Roy C. McKenna, is president, Vanadium-Alloys Steel Co., Latrobe, Pa.

gradually before being placed in stock. Good high-speed steel can be made only from good ingots.

Steel treaters should be more vitally interested in the important changes which take place in high-speed steel during the hammering operations than that of any other working the steel receives in the course of its manufacture.

The quality of high-speed steel is dependent to a very great extent upon its structure. In further reference to "structure" the appearance of a polished and etched specimen under the microscope is meant, while "fracture" will be used to indicate the appearance of the broken surface of a bar or billet to the naked eye. The making of the structure begins under the hammer, and the beneficial effects produced in this stage persist through the subsequent operations, providing they are properly carried out. The massive carbides and tungstides present in the ingot are broken down and uniformly distributed throughout the billet.

Reducing Ingots Under Hammer

To accomplish this the reduction in area must be sufficient and the hammer blows should be heavy, so as to cause compression into the center of the billet; otherwise undesirable characteristics such as coarse structure and carbide envelopes will exist and cause the steel treater much trouble. Surface defects invisible in the ingot may be opened up under the hammering operation, in which event they are clipped from the hot billet.

Generally speaking, it may be said that high-speed steel of good quality works well under the hammer. Ingots are first hammered into billets. These billets are carefully inspected and all surface defects ground or chipped. The hammered billets are again slowly heated and receive a second hammering, known as cogging. The billet resulting therefrom is known as a cogged billet and is of the proper size for the rolling mill or for the finishing hammer.

Although it is not considered good mill practice, some manufacturers who have a large rolling mill perform the very important cogging operation in the rolling mill instead of under the hammer. Cogging in a rolling mill does not break up and distribute the carbides and tungstides as efficiently as cogging under the hammer; another objection to cogging in the rolling mill is that there is no opportunity to clip surface defects developed as they can be under the trained eye of a hammerman, thereby eliminating such defects in the finished billet.

The rolling of high-speed steel is an art known to very few. The various factors governing the proper rolling of high-speed steel are so numerous that it is necessary for each individual rolling mill to work out a practice that gives the best results upon the particular analysis of high speed steel they make. Important elements entering into the rolling of high speed steel are the heating and finishing temperatures, draft, and speed of the mill. In all of these the element of time must be considered. There is no department of a tool steel plant where the personnel of the actual operators has a greater influence upon the quality of the finished product.

High-speed steel should be delivered from the rolling mill to the annealing department free from scale, for scale promotes the formation of a decarbonized surface. In preparation of bars of high speed steel for annealing, the bars are packed in tubes with a mixture of charcoal, lime and other material. The tube is sealed and placed in the annealing furnace. The temperature of the furnace is gradually raised to about 1650 degrees Fahr. and there held for a sufficient length of time, depending upon the size of the bars. After very slow cooling the bars are removed from the tube. They should then show a Brinnell number of between 235 and 275.

The inspection department of a high-speed steel mill ranks with the chemical and metallurgical departments in safeguarding the quality of the manufacturer's product. Inspectors examine all finished material from the standpoint of surface defects, hardness, size and fracture. They reject such steel as is judged not to meet the manufacturer's standard. The inspection and metallurgical departments work hand-in-hand, and if any department is not functioning properly it will soon become evident to the inspectors, enabling the management to remedy the trouble.

Need for Detailed Study

As to the heat-treatment of high-speed steel, it is customary for the manufacturer to recommend to the user a procedure that will give to his steel a high degree of cutting efficiency. The recommendations of the manufacturer should be conservative, embracing fairly wide limits, as the tendency of the user is to adhere very closely to the manufacturer's recommendations. Unless one of the manufacturer's expert service men has made a detailed study of the customer's problem, the manufacturer is not justified in laying down set rules, for if the customer does a little experimenting he can probably modify the practice so as to produce results that are well adapted to his line of work.

The purpose of heat-treating high speed steel is to produce a tool that will cut so as to give maximum productive efficiency. This cutting efficiency depends upon the thermal stability of the complex hardenites existing in the hardened and tempered high-speed steel. The writer finds it extremely difficult to convey the meaning of the word "hardenite" to those that do not have a clear conception of the term. The complex hardenites in high-speed steel may be described as that form of solid solution which gives to high-speed steel its cutting efficiency. The complex hardenites in high-speed steel are produced by heating the steel to a very high temperature, near the melting point, which throws into solution carbides and tungstides, provided they have been properly broken up in the hammering process and uniformly distributed throughout the steel. By quenching the steel at correct temperature this solid solution is retained at atmospheric temperature.

Practice Becoming More Uniform

It is recognized that high-speed steel can be heat treated to give satisfactory results by different methods. It is, however, believed that the American practice of hardening and tempering high-speed steel is becoming more uniform. This is due largely to the exchange of opinions. The trend of American practice for hardening high speed steel is toward the following:

First: Slowly and carefully preheat the tool to a temperature of approximately 1500 degrees Fahr., taking care to prevent the formation of excessive scale.

Second: Transfer to a furnace, the temperature of which is approximately 2250 degrees to 2400 degrees Fahr., and allow to remain in the furnace until the tool is heated uniformly to the above temperature.

Third: Cool rapidly in oil, dry air blast, or lead bath.

Fourth: Draw back to a temperature to meet the physical requirements of the tool, and allow to cool in air.

It was not very long ago that the desirability of drawing hardened high speed steel to a temperature of 1100 degrees Fahr. was pointed out, and it is indeed encouraging to learn that comparatively few treaters of high speed steel have failed to make use of this fact. Many steel treaters at first contended that the steel would be soft after drawing to this temperature and it is only recently, since numerous actual tests have demonstrated its value, that the old prejudice finally has been eliminated.

France Ties Up American Steel

Government Will Not Release Large Surplus Stocks Purchased From the United States, Although Consumers Are Clamoring for Them—Senatorial Commission Demands Return of War Profits Earned by Citroen—News Notes From Paris

BY FRANCIS MILTOUN

French Correspondent of The Iron Trade Review

DESPITE the fact that many manufacturing plants have had to stop or slow down owing to lack of transportation of material, large stocks of iron and steel in various parts of France are being withheld from the trade. American material purchased during the war, but now suitable for construction and manufacturing purposes is lying unprotected at Bordeaux, whereas it might be put to immediate use.

On the quays of Bordeaux, Salinière, la Monnaie and Sainte Croix there are what the French describe as "mountains" of steel girders, of square and round bars, of plates and strips. They cover the width of the quays for more than a kilometer. Meantime, what small stocks are available from French producers are soaring in price, advances of $3 to $5 per 100 kilos (220 pounds) being made at a time.

The surplus stocks have been accumulating for months, although the government bought them last September. A big sign was posted at one end of this three-quarter mile long open air warehouse used by the American expeditionary force: "Importations from America." The French government was anxious to get quick possession of the material and when it bought it the sign was promptly replaced by one reading: "Property of the French government." And like the surplus stocks of food and tobacco, the public can buy very little of it, except at prices which include 200 and 300 per cent profit over the price paid the American government. Sometimes it is not offered in the open market at all, and this appears to be the case with the Bordeaux stocks of steel and iron. Meantime the consumer is clamoring for what he sees, but cannot touch.

A similar situation prevails at other ports. Thousands of tons of good merchantable finished steel and iron are abandoned to the wear and tear of the weather. The various ministries which have been appealed to say: *Tarte a la creme.* No coal, no labor, not sufficient means of transport! Deadlock!

Monsieur Claville, the minister of transport had more freight cars than he knew what to do with, and not enough locomotives to move those which might have been used. This was a fortnight ago, and since then Monsieur Claville has been called to a high post in Alsace.

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Demand Return of War Profits

A senatorial commission for the revision of contracts has just made a report on certain contracts granted in 1918 with regard to the former government arsenal of Roanne, which was operated by a group of industrial leaders of which Monsieur Andre Citroen was the head. The government is seeking to recover 2,644,606 francs which it claims were overpaid on this account. Monsieur Citroen defends himself against the charges made in the report.

"The ministry," says Monsieur Citroen, "was bound to have shells in the greatest possible quantity and in the shortest possible time."

Monsieur Millies-Lacroix protests against the prices paid. Monsieur Citroen replies: "It is right and proper that the ministry should seek to put the matter on a just basis, but to gain time many formalities that might otherwise have been in force were ignored or waived."

Monsieur Citroen claims to have invoiced his deliveries at cost price. This is at variance with the claims of the government. It is true that the government failed to get the arensal into production and called on Monsieur Citroen to lend his aid and skill as an organizer and producer.

* * *

French Purchase of Thyssen's

Monsieur Loucher, French minister of reconstruction, recently received a committee of the consortium of French interests which has just acquired the Thyssen Hagondange plant in Lorraine. The directors of the Groupment des Consommateurs were presented to the minister by the Baron Petiet and Monsieur Louis Renault, both leaders in the French automobile industry which controls the new project.

Various questions relative to production and the supplying of this great plant with coke that it may be put into full production were discussed. Coke is all that is lacking as the plant has ore mines in its dooryard.

The purchase of this plant makes these large French consumers of iron and steel independent of other producers. The combination includes the great Panhard firm, Brazier, Citroen, Clement-Bayard, Delaunay-Belleville, Peugeot, the Schneider automobile firm, distinct from the Creusot Schneiders, Renault, Caille of Lille, Japy Freres and others. It is decidedly the largest development which has been brought about in the pooling of manufacturing interests in France.

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Lorraine Coal Output

The following official figures concerning the Lorraine mining industry have been received from Metz: The production of iron ore for October, 1919, was 665,000 tons, practically the same as that in August, but larger than in September. The insufficiency of transportation has resulted in the stocking of 100,000 tons at the mines. Shipments in October were 562,000 tons, of which the largest classifications were as follows: To Lorraine industries, 233,000 tons; to Luxemburg, 50,000; to Belgium, 33,000; to the Sarre industries, 107,000; to occupied Germany, 28,000; to unoccupied Germany, 102,000.

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Railway Makes Purchase

The Eastern railway of France has bought 228 tons of car couplings, paying the equivalent of $38.15 per 220 pounds. Various steel forgings and profiles were ordered at $9.05 per 220 pounds. Fifty-five gray iron gas retorts were purchased at $10.50 per 220 pounds.

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Italy Buys Steel in France

The Ilva Co., of Italy has been negotiating with a group of French steel producers for a large tonnage of blooms and billets. The group referred to is the Comptoir Siderurgique de France. The basis of the transaction is as follows:

The group will deliver to the Ilva Co. 80,000 tons of semifinished products at the rate of 20,000 tons each trimestre of the ensuing year. The group agrees not to furnish, other than to Ilva, more than 20,000 additional tons of beams or shapes, and that if Ilva chooses it may have half of this. Prices are not to be fixed in advance but will be computed during the last two weeks of each

three months for the three months to follow.

Whatever may be the wheel within the wheel of this not too clearly expressed transaction, it indicates that France by all possible means is seeking Italian trade and that there are prospects of her obtaining a large share of it.

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Must Be Identified

The commercial representative, whether his firm is in France, the colonies or in a foreign country, is now required to have a special identification card. This will be delivered to foreigners after declaration is made to the French consular representative in his district, and the payment of a fee of 10 francs. The law making this obligatory was promulgated Oct. 10, 1919.

* * *

Announce Polish Contract

The Polish commission established here for the purpose of making foreign purchases, announces that a contract is about to be placed in America with the Baldwin Locomotive Co., for 150 locomotives of the Consolidated type. Payment is to be made in dollars within a period of 10 years. Considering the low value of the mark at present this last condition may be considered of great importance.

* * *

Want Universal Patent

An international congress of inventors was held recently in Brussels, which is far more international as a convention city than Geneva, hitherto counted as the cross roads of Europe. Effort was given to the possibility of one day achieving an international patent system whereby one patent would afford universal protection. Like so many other congresses and conventions which have been held among neutral and allied nations since the armistice this one was merely preparatory for future effort. An attempt will be made to enlist the support of all inventors.

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May Use Steel Tubes

Boiler tubes in Belgian locomotives have always been made of copper. It was supposed that impurities in the water made this necessary. German locomotives, with steel tubes, ran constantly during the war on Belgian roads and now there is agitation in Belgian railway circles for the substitution of steel for copper for locomotive tubes. A recent order placed by the Belgian state railways was for 7400 steel tubes and 50,000 copper tubes, so there is no more than a disposition to experiment at present.

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Standardization in France

There is a quasigovernmental committee working in France toward the standardization of certain iron and steel commodities for use in various industries. That nearest to the government is the railway, three out of the seven great trunk lines of the country being owned by the government, with two others to revert to the government during the next decade. Hence a beginning has been made in the standardization of rails, spikes, bolts, nuts and accessories. When the complete plan is made public it will be valuable to all interested in the market.

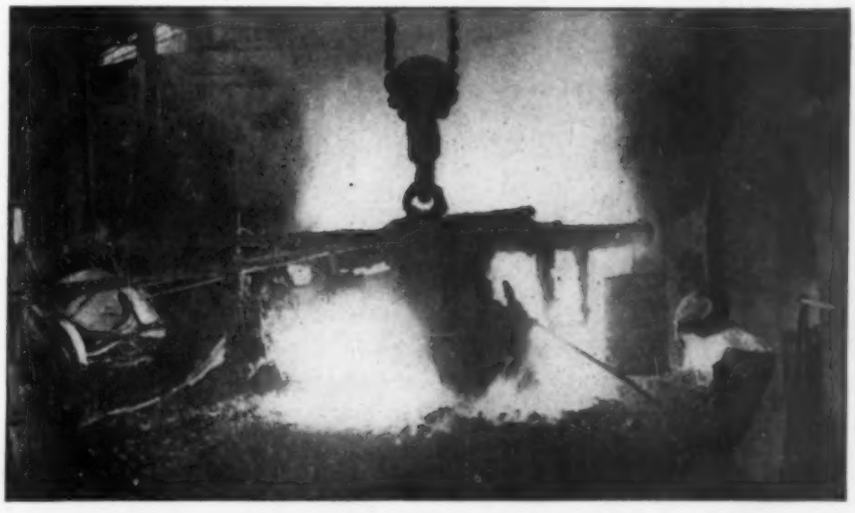
Developing Hydroelectric Steelmaking

French Correspondence of The Iron Trade Review

THE godmother of electric steel in France is hydroelectric power. For this reason the French Alpine regions of Dauphiny and Savoy have become the center of the new industry. The French Alps today are supplying 1,045,000 horsepower, compared with but 70,000 in 1890. Today's hydraulic power of the Alps represents the equivalent of 6,270,000 tons of coal. Metallurgical operations absorb 303,000 horsepower; the chemical industry 255,000, while the remainder is distributed to other industries and used for light and traction purposes. The total is considerably less than the same regions in Italy offer, but the progress in the past two decades in France has been notable. The progression so far as metallurgy is concerned indicates an increase from 210,000 horsepower in 1910 to 255,000 in 1916.

A dozen years ago when the limit of ingenuity in production of special steel was supposed to have been attained there came into prominence in French metallurgy the names of Heroult, Chapelet, Keller and Girod, the precursors of electrometallurgy in France today. Their efforts were more or less influenced by the genius of the savant Moissan. However, Seimens as far back as 1879 took the first steps which led to the notable achievements a quarter of a century later.

The electric furnace was found to be most suited for reduction of bauxite ore and the production of aluminum and was first applied commercially in France for this purpose. At La Praz in Savoy in 1902 2000 kilos of aluminum were obtained from one charge. Of all the French experimenters Paul Girod, the head of the great Ugine plant in Savoy, was the most enthusiastic. He conceived the first French electric steel plant for the production of special steels in quantity. Girod's effort made possible the production of tons of steel at one charge, where before the output amounted to but a few hundred pounds. Moissan,



A HYDROELECTRIC CHEMICAL PLANT IN THE DEPARTMENT OF THE ISERE, FRANCE

in his first experiments, melted but 10 grammes of sugar in his rudimentary *four electrique*, whereas Girod made 170 tons of steel in a single day, an amount practically equal to a third of the daily production of steel in the great Creusot plant before the war. The Girod plant produced much metal of importance in the construction of airplanes. It also made the steel which was used in making the turrets of the Renault "baby tanks" which were used by the Americans in their advance in the Argonne.

Production Cost Reduced

The Girod furnace is of the balancing type, but has an original device for tipping. It is charged through a lateral port. The principal electrode enters through the top of the furnace, while the other enters from the bottom.

Where waterpower is available for generating the current, the electric furnace is producing steel in France at less cost, all factors considered, than is the steel plant using coke or coal. Only the great expense of the electrode, the largest in use being more than 5 feet in length, may be said to have an appreciable bearing on final cost. At the Girod plant the cost of replacing electrodes in a 25-ton furnace is equivalent to $100, at the rate of exchange before the war. In a single building there are 10 furnaces, the largest having a capacity of 25 tons. The entire production of the plant is 60,000 tons per annum. The plant has available 100,000 horsepower, its sole source being the mountain streams of the Alps.

The electrometallurgical industry of the French Alps of Dauphiny and Savoy is centered at the Paul Girod plant at Ugine in the valley of the Arly; at the Keller-Leleux plant in the department of the Isère; and in plants in the valleys of Romanche and the Arc, the latter group including that of La Praz. In central France the Firminy plant on the Loire, obtaining its electric power from Riouperoux in the Isère, is one of the most notable outside the mountain regions.

The annual report of the Forges et Acieries Electriques Paul Girod, published Nov. 28, 1919, states:

"It is desirable that an increased working capital be acquired in order to pursue energetically the future development of the company's hydraulic enterprise.

Waterpower exploitations actually employed	6
Horsepower of installations	46,000
Annual kilowatts furnished	168,000,000
About to be added (exploitations)	1
Increased horsepower	8,000
Annual increased kilowatts	28,000,000
In further process of construction (exploitations)	2
Expected further increase	18,000
Expected further kilowatts	36,000,000
Other future projects (exploitations)	6
Future additional horsepower	56,000
Future expected kilowatts	213,000,000

"When the company's plans are fully realized it will possess an electric force of 128,000 horsepower with a potential of 446,000,000 kilowatts annually."

The stockholders approved the action of the board, and the capital of 22,500,000 francs is to be immediately increased to 30,000,000 francs.

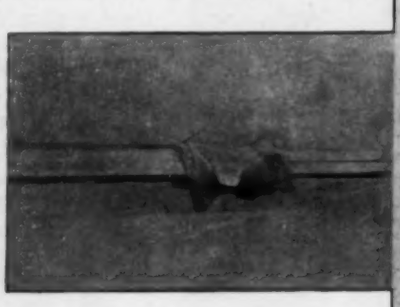
British Make Progress in Carbonizing Coal

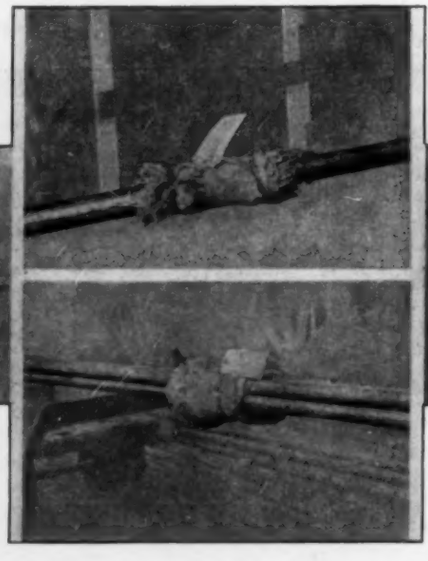
At a recent meeting of the board of directors of the Low Temperature Carbonisation, Ltd., London, Eng., H. L. Armstrong, managing director, explained the progress made by the company in applying its patented process of coal carbonization. According to Mr. Armstrong, each ton of coal carbonized by low temperature methods yields 3 gallons of motor spirit; 16 gallons of oils for burning, lighting and lubricating; 7000 cubic feet of gas of 600 heat units per cubic foot after removing light oils; 20 pounds of sulphate of ammonia; and 1500 pounds of smokeless fuel.

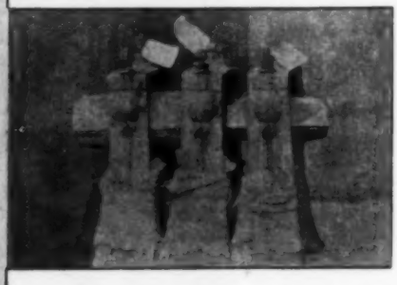
The Barnsley plant of the company was operated from April to September and the results obtained are said to have justified earlier claims for the carbonizing process. A contract has now been arranged with an electric power company in Yorkshire to erect a plant and supply all the gas that can be made from the carbonization of 500 tons of coal per day. This gas is to be burned in the power company's boilers in place of raw coal, and since the company in question is one of the foremost in the country and supplies its electric power at a very low rate, the carbonization company is offering to supply the power station with gas at a price which shows a great saving over coal. Negotiations also are practically complete for a plant to carbonize 500 tons of coal per day near Sheffield.

Protected Duplicate Shipping Tags Reduce Losses

THROUGH frequent destruction of shipping tags with which shipments are marked, shafting, bar iron, bundles of steel, castings, building material and other articles of this nature frequently are lost because a complete and satisfactory identification of the lost articles is impossible. W. H. Gatchell, staff officer, loss and damage prevention department, Southern Railroad lines, Washington, believes that such losses in transit can be stopped effectively and suggests that a second tag made out in duplicate be securely wired to each bundle and concealed under burlap wrapping as shown in the accompanying illustrations.







Puddled Iron Practice Improves

Years Ago, When Steel Attracted Ironmakers From Their Puddling Mills, the Development of the Iron Industry Lagged—Now Puddled Iron Manufacture is Recovering—Economical Furnaces Designed

BY J. E. FLETCHER

IN DR. DESCH'S paper on the "Evolution of the Puddling Process," presented before the Staffordshire Iron and Steel institute last February, it was pointed out that Joseph Hall, of Bloomfield, Tipton, arrived at the truly scientific basis of puddling by what has been known as the "pig boiling" process. By promoting intimate contact at correct temperatures between molten pig iron and liquid iron-oxides he had stumbled upon, after careful thought and experiment, the fundamental method of making wrought iron.

Hall's process lies at the root of present and future puddling processes and is not likely to be superseded. It is conceivable that further attempts may be made to produce wrought iron directly from poorly silicious ores, or by the decarburization of cheaply produced mild steel, but there are fundamental difficulties in the way of success, affecting the character of the crystalline structure and the related welding and fibering properties of the resulting product.

Small Furnace Holds Field

At present the small open-hearth furnace holds the field for heating and melting the solid pig iron, and for refining in contact with liquid fettling oxides. It is indisputable that the small single-hearth furnace, operated from one side only, hand-charged, hand-fired, hand-rabbled, and balled retains its position up to now as the best means of yielding a regular product and as the readiest method of dealing with varying qualities of pig iron.

The double furnace having a larger hearth, with two working sides and operated by two sets of puddlers, and with a fire grate common to the large hearth, has tempted many manufacturers, by reason of the apparent simplicity of the arrangement and the possibility of fuel saving and larger outputs per shift. For obvious reasons the difficulty of coordinating two sets of puddlers has led to irregularity of working and to poverty and lack of uniformity in the iron produced.

In the days immediately preceding the advent of the cheaper bessemer and siemen's steel processes, wrought iron manufacture was dependent almost entirely on practiced judgment, unassisted by sufficiently available metallurgical knowledge. Good cold blast and semi-cold blast pig iron was available, as was good fuel, cheap in price and plentiful. The scrap iron available was actually the scrap from genuine wrought iron and not the heterogeneous mixture which nowadays is so prevalent.

The call of the steel works claimed the men who were beginning to bring scientific knowledge into the domain of iron making, and to a very considerable extent wrought iron manufacture has stumbled on without them.

Thirty years or more have passed, and yet there are running in some parts of the country the same engines and mills which slowly struggled with puddled material 40 and 50 years ago.

If Hall's scientific puddling method is the fixed basis for wrought iron manufacture, the need of the future is a plant which shall utilize the principle with the least possible expenditure of fuel and labor.

Three Factors in Puddling

The three problems immediately presenting themselves to the investigator of the puddled iron question rest on three dominant facts:

1. The puddling furnace, as we now know it, is one of the most wasteful of metallurgical furnaces, using more fuel per ton of product than any other continuous process.
2. The labor cost per ton is abnormally high, as is also the cost of furnace upkeep.
3. The rolling, shingling and material handling and transport plants are usually crude and excessively wasteful in power cost per ton of product.

The first problem is "How can the fuel bill be lowered?"; the second, "How can labor and repair costs be reduced?"; and the third, "How can rolling and the other mechanical branches of the iron-making business be improved?"

Compared with modern open-hearth steelmaking furnaces the coal-fired puddling furnaces use from three to five times the quantity of coal per ton of product, the velocity of the hot gases across the hearth of a puddling furnace being above twice that in a well designed steel furnace. The radiation losses in a puddling furnace and its waste heat boiler amount to at least 20 per cent of the heat energy of the coal burned, or equivalent to say 560 to 784 pounds per ton of puddled iron made, whereas in the steel furnace the radiation losses do not generally exceed 224 pounds per ton of steel cast.

Radiation Surfaces Compared

In a puddling furnace the radiation surfaces per hundredweight of metal charged average 30 to 35 square feet, whereas those of the open-hearth steel furnace do not exceed 2 to 3 square feet (up to the checker chamber inlets). Again, the bath or hearth area per hundredweight of charge in the puddling

From a paper presented at the fifty-fourth session of the Staffordshire Iron and Steel Institute, Dudley, Nov. 22, 1919. The author, J. E. Fletcher, is past president of the institute.

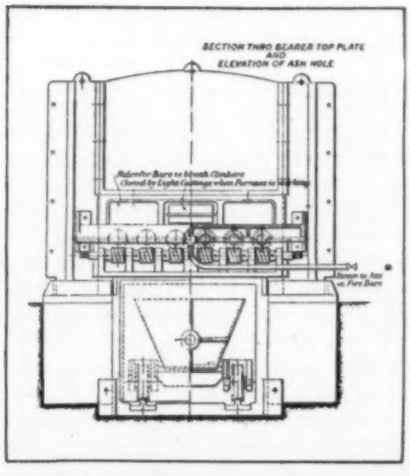


FIG. 1—END ELEVATION OF FURNACE ARRANGED FOR EASY REMOVAL OF ASHES

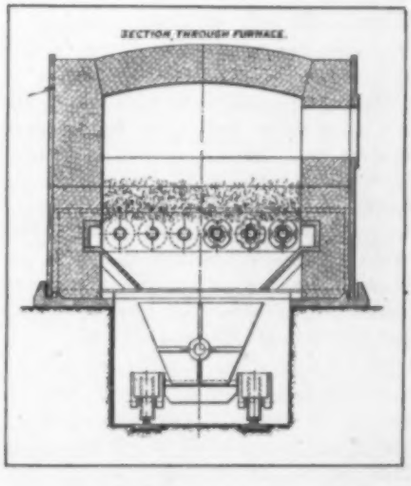


FIG. 2—SECTION THROUGH FURNACE SHOWING ARRANGEMENT OF GRATES

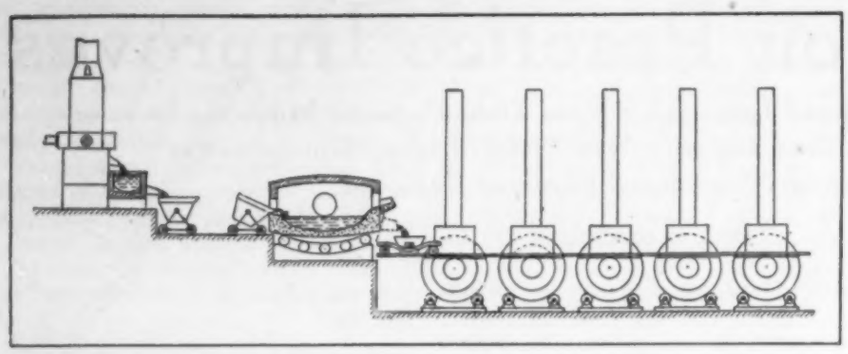


FIG. 3—DIAGRAM SHOWING ARRANGEMENT OF UNITS OF DUPLEX PLANT DEVELOPED BY J. E. FLETCHER

furnace is about 20 times that of the steel furnace. It has been stated that the radiation losses per square foot of inner wall surface vary directly with the temperature head and as the square root of the gas velocity and inversely as the wall thickness, the relation being roughly expressed by the formula

$$R = \sqrt{V}\left(T_1^4 - T_0^4\right)$$

Where R=Radiation index; V=Velocity of gases through furnace in feet per second; T_1 = Absolute temperature at inner flame-side of wall of furnace; and T_0 = Absolute temperature at outer cold side of wall of furnace.

A comparison between the value of the index R in the cases of puddling and steel melting open-hearth furnaces can be readily made, but for more exact calculations the formula of Professor J. W. Hinchley and the excellent radiation chart given by Sir Robert Hadfield and Mr. Sargent in their paper on fuel control read before the last meeting of the Iron and Steel institute is the latest aid and of the greatest practical importance to all furnace designers and students.

Effect of Hearth Area

The fact that to effect puddling in the open hearth the area of the hearth required to puddle a ton of iron is 20 times that necessary to melt and refine a ton of iron and scrap in an open hearth steel furnace is of importance. This shows very clearly that the small furnace is the hindrance to fuel economy, its relatively large hearth being allied with excessive radiation areas. This explains the extent of the radiation losses, amounting to about 672 pounds of coal per ton of puddled product.

The metallurgical requirements of the melting, super-heating and refining of the metal charge is a fixed quantity, amounting to from 448 to 560 pounds of coal per ton of puddled iron.

The necessity to keep the puddling furnace at between 1200 degrees Cent. and 1450 degrees Cent. fixes the radiation losses and these, along with the irreducible requirements for melting, refining, etc., demand the minimum use of 1120 to 1344 pounds of coal per ton of product.

In addition to this the heat energy escaping to the boilers and chimneys amounts generally to a further 2016 to 2240 pounds of coal per ton of puddled iron, half of which is usually utilized in steam raising.

Improvements in Small Furnaces

The construction and proportions of a good coal-fired puddling furnace as at present used have been arrived at through long years of experience, and, as far as the hearth and heating chambers are concerned, these details are not likely to be substantially altered or improved. There is, however, a possibility of improving the grate and firebox, and of providing an efficient means for burning the poorer coals now so common.

In the grates usually provided the firebars are plain rolled flat or square bars, resting on bearers, with no arrangement for ensuring correct air spacing. The bars bend and twist in working and often enough become covered with adhering clinkers, which block the air passages. In attempting to clear the grates a number of bars may be pulled out together, allowing the hot fuel to fall into the ashpit and also permitting a large volume of cold air to enter the furnace to the detriment of the firebrick lining and roof.

In any case a considerable quantity of unburned fuel falls into the ashpit, so much so that the ashes are often sifted and washed in order to recover the breeze or "gleads."

With a view to overcoming this difficulty and to the economizing of fuel the arrangement of furnace grate shown in Figs. 1 and 2 has been designed by the author.

The grate consists of a series of tubular bars, perforated for air ejection, over which a number of specially shaped chilled cast iron disks are threaded. These form a kind of roller, grooved longitudinally so that when rotated by hand or power, clinkers are cracked and the burnt ashes accumulating in the troughs between the roller bars rolled into the ashpit, and the surface of the fuel bed disturbed whenever necessary.

The air required for combustion is forced through the tubes by steam jets and passes out through the perforations into the fuel bed and ashpit which is closed by the front plate of the ash removal car into which the ashes fall when the bars are rotated.

It will be seen that the air ducts between the grate disk are nozzle-shaped and also that the grates can be cleaned without opening the doors. Large clinkers or bats can be removed through the large holes provided above the grate in the firebox back plate.

The application of gas-firing to small puddling furnaces has also been suggested and mention should be made of a furnace built with a small producer at the firing end. A recuperator is placed under the furnace hearth for preheating the air. The furnace heating chamber has a double roof, the lower arch being perforated by a large number of small holes through which the preheated air is drawn by the chimney draught or assisted by a low pressure fan. The gas flows directly over the hearth, clinging to the roof, which, it is claimed, is thereby protected and its life prolonged. The result is a series of flame jets issuing from the roof and impinging on the charge in the hearth, and producing the turbulence which is by many considered necessary to effective combustion. By increasing the proportion of gas, sufficient heat is available to raise steam in attached waste-heat boilers.

This design is due to M. Chantraine, a distinguished Belgian furnace engineer, and it should be remarked that a number of reheating furnaces built on this principle have given good results.

Puddling in Three Stages

The process of puddling covers three stages, namely the melting stage, occupying 30 to 40 minutes, depending on the class of pig iron used and the efficiency of the fuel; the boiling stage, occupying, say 30 minutes; and the drawing and balling, followed by fettling and charging periods, occupying about 40 minutes.

It has been estimated from repeated observation on furnaces using about 3360 pounds of coal per ton of puddled product that the coal burned during the three respective stages is at the rate of, say 5152, 4144 and 1568 pounds per ton of iron made, or when 3920 pounds of poor coal per ton of puddled bar is burned,

the corresponding rates are 5936, 4816 and 1792 pounds.

The melting period, therefore, is seen to demand under present conditions 5140 to 5824 pounds of coal per ton of metal melted, and is the most wasteful stage of the puddling process. Considerable oxidation of the metal occurs, and generally the air used per pound of coal is from 2.5 to 3.0 times the theoretical amount necessary. The velocity of the hot gases passing through the furnace during this stage is not less than 4 feet per second. This high velocity at the temperature employed for quick melting is obviously related to the high radiation losses which occur during this stage of the operation.

Does Cupola Promote Economy?

At first sight it would appear that the use of the cupola using say 336 pounds of coke per ton of iron melted and supplied to the puddling furnaces, allowing for melting losses, would result in considerable economy, providing the output of the puddling furnaces is correspondingly increased. It must be realized, however, that cupola melting yields a higher carbon metal and very little reduction of the remaining metalloids, consequently the boiling period in the puddling furnace is lengthened. In the melting of pig iron in the puddling furnace the strongly oxidizing flame action during melting results in considerable refining, a sample drawn at the end of the melt being generally white iron or at least mottled in character. The author has computed that with the present capital costs there can be no net saving by using cupola metal as described.

The use of metal from the cupola, however, yields a distinct economy when a semisteel mixture consisting of steel scrap and pig iron, is used, providing special means are used for obviating the excessive iron loss and for preventing the rapid erosion of the cupola lining which otherwise would militate against the use of a continuously running plant of this type.

The author has laid down a special method of procedure based on manipulation of the slags, with a view to producing a low sulphur metal, meanwhile minimizing the iron losses and the erosion of the lining in the tuyere zone of the cupola.

A freely liquid semirefined metal is thereby obtained, well suited to final purification in the puddling furnace. Such a metal when charged into a hot puddling furnace should be ready for balling up in 15 minutes or so after charging. The fettling oxide requirements would be reduced and, by providing suitable relays of puddlers to follow up this quicker refining, the output of the furnace should be double that of the present method, a 560-pound heat being worked every hour.

The fuel needs of the furnace then would be reduced to those required for keeping the metal and furnace hot, for the reduced amount of refining, and for balancing the radiation losses.

In the usual cold pig charged plants 10 puddling furnaces can yield say 150 tons of puddled iron per week. With the cupola method using liquid pig iron eight furnaces should yield the same output, whereas with the semisteel mixture cupola process six puddling furnaces should produce the same amount.

There are certain practical difficulties connected with the production of liquid refined metal which must be overcome before the use of the open-hearth furnace can be safely attempted. In 1915 the author, in conjunction with J. Harrison, proposed a method of manufacturing puddled iron wherein direct metal from a cupola or blast furnace is poured into the basic-lined hearth of an open-hearth intermediate or roughing furnace. In this furnace, by a special slag manipulation, utilizing manganese as a means of retaining carbon in the metal while eliminating silicon and phosphorus, a semirefined product, liquid enough to be run from the furnace to ladles and thence to puddling furnaces, preferably of the gas-fired mechanical type, is secured.

B. Talbot has also proposed to use a similar arrangement, utilizing a forehearth in connection with the refining furnace whereon the cold pig iron charged can be preheated and pushed down in the heated state into the bath of the furnace.

In the carrying out of a combined bessemer and open-hearth process for making malleable cast iron some years ago, it was found that unless the open-hearth metal tapped contained over 25 per cent of carbon the metal would not remain sufficiently fluid in the ladles to enable pouring after a short lapse of time, when a semiplastic state of the metal arrived.

This trouble was overcome by manipulating the slag composition, manganese being added at a definite stage of the process and the carbon elimination thus delayed, while that of silicon and phosphorus was hastened. A liquid slag resulted and the metal poured was mobile and well deoxidized. This method was adopted in the proposed method of the author and J. Harrison, illustrated diagramatically in Figs. 3 and 4.

Employing Powdered Coal

It is stated that some 30 per cent economy in the weight of coal used has been obtained by the use of powdered coal. It is not quite clear, however, that this makes allowance for the loss of steam which must result when the fuel is burned more economically in the actual puddling process. With the use of say 50 per cent excess air per pound of coal burned instead of the more usual 250 to 300 per cent the volume of hot gases passing to the boilers when pulverized coal is economically burned can-

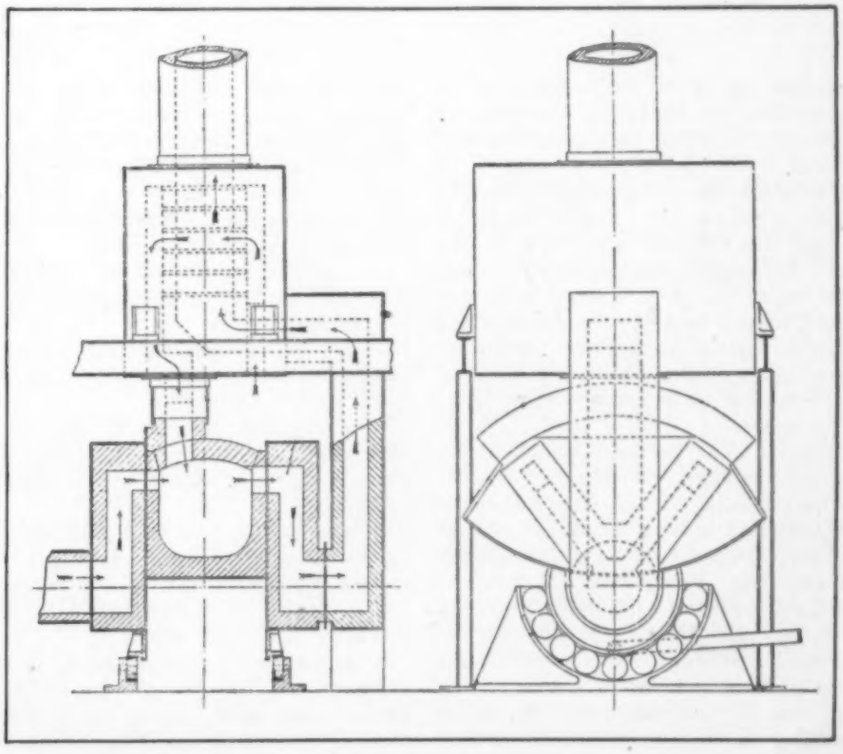


FIG. 4—DETAILS OF FURNACE USED IN DUPLEX PLANT DESIGNATED BY *F* IN ACCOMPANYING TABLE

not be more than half that of the gases leaving the ordinary puddling furnace.

It is quite conceivable that the quicker and more effective combustion during the melting period will result in a speeding-up of that stage and a possible increase in the output per furnace hour. With the hotter flame temperature during melting the correspondingly hotter waste gases would raise more steam, but after making due allowance for this, it does not seem likely that when 30 per cent less coal is used in actual puddling the steam shortage can be continuously less than 15 to 20 per cent.

That pulverized coal is likely to be of very great use in puddling forges is undoubted, but it appears to the author that if it is to be used successfully the role it should play is in connection with a complete plant of the duplex type. The open-hearth melting and semi-refining furnace should be so heated and the hand-fired or preferably mechanically operated, puddling furnaces similarly heated.

In either case the work of the puddler must be very greatly reduced, and as the waste heat from the open-hearth melting and the puddling furnaces could be used for steam raising in a much more efficient manner than at present a puddling process should be available capable of producing puddled bars on a raw coal consumption not exceeding half the present figures.

Such a plant has been devised by the author, utilizing the principle of the duplex process already described. The arrangement consists of an open-hearth tilting or fixed basin-lined furnace, the waste heat from which is used in attached efficient boilers fitted with auxiliary fuel supply apparatus—for increasing the steam requirements during the charging and tapping stages.

From the open-hearth melting, partial refining or roughing furnace the metal is ladled to mechanical puddling furnaces, also fired with pulverized coal and to which waste-heat boilers are attached.

Each of the units composing the proposed plant are at work. The open-hearth furnace is regularly melting iron on a pulverized coal consumption of 448 to 560 pounds per ton of iron melted. Puddling furnaces similarly fired are operating on a consumption of 1300 to 1600 pounds per ton of puddled bar, when dealing with cold pig iron. When puddling molten charged material the coal burned should not exceed 800 to 1000 pounds per ton of product, six furnaces doing the work of the present 10.

If the roll trains and shingling machines or squeezers be operated by electrical power, and they can be, it is conceivable, that, given cheap electrical energy, such a combination of the duplex system with mechanical puddling furnaces and with electrical rolling and shingling equipment should furnish the most economical puddling plant possible.

The accompanying table has been prepared to indicate as nearly as practicable the distribution of the heat expended in six types of puddling processes.

A is a plant of 10 normal puddling furnaces, coal-fired and using cold pig iron charges.

B that of an eight puddling furnace plant, coal-fired, with liquid charged metal from a cupola.

C is a similar plant to B, but with only six puddling furnaces, and a cupola supplying liquid semi-refined metal.

D is a similar plant to C, but using an open-hearth, gas-fired melting and refining furnace instead of the cupola.

E is the case of a similar plant to A, but using pulverized coal.

F is the duplex process plant, with roughing or semirefining open-hearth furnace and four rolling type, mechanically operated puddling furnaces. All plants are heated by pulverized fuel. In all six cases the plants are equipped with waste heat boilers and spare independently fired boilers where required. Where the plant F is equipped with modern steam boilers of high efficiency supplying steam to economical engines driving the roll trains and shingling or squeezing tools the fuel expenditure should be further reduced by at least 336 pounds per ton of puddled product.

Consumption of Coal in Seven Typical Plants

	Pounds Per Ton of Puddled Product					
	A	B	C	D	E	F
Melting, refining, superheating of metal. Useful work	448	202	123	123	336	...
Radiation losses at puddling furnaces	560	414	258	258	448	...
Radiation losses at boilers	224	190	123	123	168	...
Steam raising:—						
(a) For engines and hammers	538	538	414	414	358	...
(b) For auxiliary purposes	470	112	...	...	...	...
Chimney losses from puddling furnaces	1120	672	426	426	336	...
Melting work in cupolas	...	168	202	...	...	...
Cupola stack losses	...	112	134	...	...	...
Melting work in open-hearth furnaces	...	...	...	258	...	146
Radiation and chimney losses, furnaces	...	...	...	190	...	224
Steam raising (at spare boilers)	...	358	594	594	638	762
Chimney losses, boilers	...	146	246	246	258	246
Refining, etc., in mechanical puddling furnaces. Useful work	...	...	...	...	...	78
Radiation losses, puddling furnaces. Useful work	...	...	...	...	...	258
Steam raising, puddling furnaces. Useful work	...	...	...	...	...	168
Chimney losses, puddling furnaces. Useful work	...	...	...	...	...	224
Total equivalent coal per ton of puddled products	3360	2912	2520	2632	2542	2106

Study Sulphur Compounds in American Coal

In the chemistry department of the engineering experiment station of the University of Illinois, Urbana, Ill., a thorough investigation has been made of the nature of the four sulphur compounds in coal, the quantity of each form present, and the change which characteristic forms undergo when the coal is allowed to stand or is subjected to coking.

The following methods were developed for the quantitative analysis of each form of sulphur:

1. The sulphate sulphur was determined by extraction of the coal with dilute hydrochloric acid.
2. The pyritic sulphur was determined by extraction of the coal with dilute nitric acid; it having been found that nitric acid of a certain dilution has a selective action on sulphur combined as iron pyrites.
3. The resinic sulphur was determined by extraction of the coal with phenol.
4. The humus sulphur was determined either by a direct method or by the difference between the sum of the other three forms and the total sulphur in the coal.

These investigations, which were made by A. R. Powell with Prof. S. W. Parr, are published in a bulletin recently published by the engineering experiment station.

Specifies Safety Guards

The Massachusetts state board of labor and industries has issued a bulletin of regulations for the placing and use of shafting in shops. According to this booklet, vertical transmission shafting exposed to contact shall be encased to a height of 6 feet from the floor. Horizontal transmission shafting, exposed to contact, less than 7 feet from the floor, shall be encased or protected by a suitable guard. Dead ends of shafts less than 7 feet from the floor must be cut off or suitably guarded. The guards must be of such a nature that a hand or other part of the body cannot project through, around or underneath, and thus be injured.

Studies Friction Losses in Rolls

Apparatus Designed to Fit in Ordinary Mill Housings and Capable of Registering Pressures on Roll Necks Soon Will be Used to Determine Friction Losses on Experimental Mill

BY W. B. SKINKLE

NEED of accurate knowledge of the forces acting on rolls and the friction losses on roll necks in different types of rolling mills is prompting investigations to be made which, it is believed, will prove of great value in the design and operation of steel mill equipment. A device soon to be tried out on the experimental rolling mills at the Carnegie Institute of Technology, Pittsburgh, is expected to give positive, accurate knowledge, not only of the relative values of the various lubricants and bearing metals used on roll necks, but also of the spreading forces acting on the rolls; from which data the stresses in rolls and housings may be calculated to a far greater degree than is at present possible.

Cylinders Support Load

This device consists of two hydraulic supporting cylinders, marked cylinder No. 1 and cylinder No. 2 in the accompanying illustration, located in the bottom of the roll housing window and so arranged that they can be removed easily and replaced by a filler. The carrier for the bottom roll rests on the plungers of these cylinders in such a manner that the forces acting on the roll neck are recorded by the resulting hydrostatic pressure in these cylinders. The illustration shows a bloom between the upper and lower rolls and the conditions existing at the lower roll neck. These conditions are greatly exaggerated in the drawing for the sake of clearness.

The total spreading force, F, due to the bloom pinched between the rolls, will cause a heavy force to be transmitted from the roll body to the neck and to be applied to the center of the bearing. Such an application of the forces would cause one half of the load on each bearing to be carried by cylinder No. 1 and the other half by cylinder No. 2. The proportion of the total force, F, which is distributed to each neck of the rolls will depend upon the location of the pass in the roll body and can be figured by the well-known principles of beam reactions.

When rotation starts and the bloom is being rolled, the point of contact between roll neck and bearing changes to some other point. The force, P, then is applied to the bearing as indicated and the lower roll carrier has a tendency to assume a new position using the roller C as a fulcrum point to lift the roller D off its seat. It is vitally important, however, that the bearing be perfectly free to rotate as indicated, and that no forces other than the cylinders Nos. 1 and 2 be interposed to prevent the rotating tendency. In actual practice it is expected that not more than .003 or .004 inches of movement will be obtained on these cylinders between no load and their maximum carrying capacity of 250,000 pounds each. When the contact point has moved to a plane where it slides back as rapidly as it tends to climb, the angle of sliding friction has been reached and a condition of equilibrium is again established.

These conditions are shown and analyzed in the illustration. The pressures on the supporting cylinders will no longer be equally distributed, as in the case of static conditions, but will be much heavier on cylinder No. 1 than on cylinder No. 2. In the analysis of these conditions the following symbols are used:

P=Total resultant force on the roll neck, in pounds.

R=Radius of the roll neck in inches.

u=The angle whose tangent is the coefficient of friction.

D=Distance from center line of roll housing to center line of supporting cylinder.

d=Distance from center line of roll neck bearing to the point of contact between the neck and bearing.

N=Some fraction of P greater than one-half.

M=Some fraction of P less than one-half.

If equilibrium in a free body is maintained, the sum of all horizontal or vertical forces acting on the body must be equal to zero, and the sum of the moments of all forces acting on the body taken about any point must equal zero.

Fulfilling the first condition, as applied to the vertical forces on the lower roll-neck bearing we have—$P + NP + MP = O$
then $NP + MP = P$ and
canceling the P's we have
$N + M = 1$.

This shows that for each increase over one-half of the total load carried by cylinder No. 1 there is a corresponding decrease in the load carried by cylinder No. 2 and that the sum of the pressures on cylinders Nos. 1 and 2 must be equal to the force P. This same fact can be shown by taking moments about the point X where the roll neck applies its load to the bearing. In this case the force P has no lever arm. Its moment would therefore be zero, and it may be neglected. Taking moments about X we have
$+ NP\ (D\text{-}d) - MP\ (D+d) = O$,
which expands into
$NPD - NPd - MPD - MPd = O$ .....(1)
Taking moments about Y, the center of the roll neck we have
$-Pd + NPD - MPD = O$.....(2)
Subtracting equation (2) from equation (1) we have
$PD - NPd - MPd = O$; or $NPd + MPd = Pd$ and canceling the P we have $N + M = 1$.

Component Forces

The force P applied at X may be resolved into its component forces; one normal to the tangent of the contacting surfaces and the other parallel to this tangent. As shown the force normal to the tangent will be equal to $P \cos u$, and the tangential force will equal $P \sin u$. These two component forces may then replace the original force P, and are indicated by dotted arrows applied to the point X.

If moments are now taken about the point Y it will be noticed that the force $P \cos u$ has no lever arm, therefore a zero moment, and the equation becomes
$-P \sin u\ R + NPD - MPD = O$, or by transposing
$P \sin u\ R = NPD - MPD$, and by rearranging we have
$P \sin u\ R = (NP - MP)\ D$ (3)
In the above equation NP is equal to the total pressure on cylinder No. 1 and MP is equal to the total pressure on cylinder No. 2, also D is equal to the lever arm of one cylinder.

It is readily seen therefore, that the difference between the total pressures on the cylinders, when multiplied by the lever arm of one cylinder, is the exact measure of the resisting forces due to friction on the roll neck and it is only

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necessary to multiply this quantity by the surface speed of the roll neck in feet per minute and divide this result by the radius of the roll neck in inches, to derive the number of foot pounds of work lost in friction at this point.

Dividing this same quantity $(NP - MP)\ D$ by the sum of the recorded pressures and also by the radius of the roll neck in inches, gives the sine of the angle whose tangent is equal to the coefficient of friction between roll-neck and bearing. This can be expressed mathematically as follows: Rearranging equation 3 we have

$$\text{Sin } \alpha = \frac{(NP - MP)\ D}{(NP + MP)\ R} \quad \ldots\ldots (4)$$

The sum of these quantities $(NP + MP)$ also gives the load applied to the housing which carries that particular roll-neck, and by adding these quantities obtained from the corresponding cylinders in the housing on the other end of the roll, the total load on the roll is obtained.

The foregoing is true only if the hydraulic support cylinders are frictionless. Were these hydraulic cylinders of the ordinary hemp packed plunger type, the results obtained would be almost useless as the friction of the packing on the plunger would be very large and the exact amount would be very difficult if not impossible to obtain. It is necessary, therefore, to produce a frictionless hydraulic support cylinder and this is believed to have been accomplished. While it is recognized that no machine can be absolutely frictionless, this cylinder so nearly approaches the ideal state that for all practical purposes it may be considered as frictionless.

This cylinder consists of an upper or guide cylinder securely bolted to its base by 16 ¾-inch bolts. The base, which is really the cylinder proper, has a groove of 9¼ inches inside diameter cut into it. The center portion of the base is then faced off to allow just a film of fluid not over 1/16 inch in thickness to act on a special stretched steel diaphragm which is securely held in place by the friction between the parts of the cylinder and is made tight on its lower side by a soft lead gasket. By this means the fluid is completely confined in the cylinder, the only escape being through the orifice leading to the recording pressure gage. The plunger does not come in contact with the fluid in the cylinder but rests on the upper side of the steel diaphragm, consequently these contacting surfaces must be very flat and true.

To avoid friction between the plunger and the side walls of the guide cylinder, the plunger is turned ⅛-inch smaller in diameter than the guide cylinder on its upper parts, and .005 inch smaller in diameter where it rests on the diaphragm. To prevent lost motion or the plunger from tilting and shearing the diaphragm and further to prevent the plunger from getting off center and having a rubbing contact with the cylinder walls, two rings of 56, ½-inch steel balls are provided. The inside diameter of the guide cylinder is ground to as nearly a perfect circle as possible and the grooves for the balls are ground and polished to a perfect fit.

When the plunger moves downward due to the application of a load these steel balls tend to lift off their seats and establish a rolling contact between the plunger and cylinder walls. Thus the only friction on this cylinder is the friction of the ball bearings, the internal friction of the steel in the diaphragm and the friction of the fluid on the pipes leading to their recording gages and these quantities are so small when compared with the maximum load of 250,000 pounds which each cylinder is designed to carry, that they may be neglected.

Displacement of fluid by the plunger when under load is equally small since a pressure of one pound per square inch compresses water in volume one part in 300,000. For water in an iron pipe this corresponds to a compression of 2 inches per mile of length for a pressure of 10 pounds per square inch. Such a compression of the fluid will not disturb the roll setting. The only other factors entering into the plunger displacement will be the quantity of fluid necessary to move the needles of the recording gages and the expansion of the short pipes leading to these gages. Both of these factors are so small that they may be neglected.

Design is Not New

Designs of the frictionless diaphragm cylinder is not new but has had several stages in its development. It appears to have been originally invented by Mr. Emery who first applied it to the well known testing machine bearing his name. The general application of this invention was delayed by the fact that Mr. Emery measured the pressure in his hydraulic supports by means of a com-

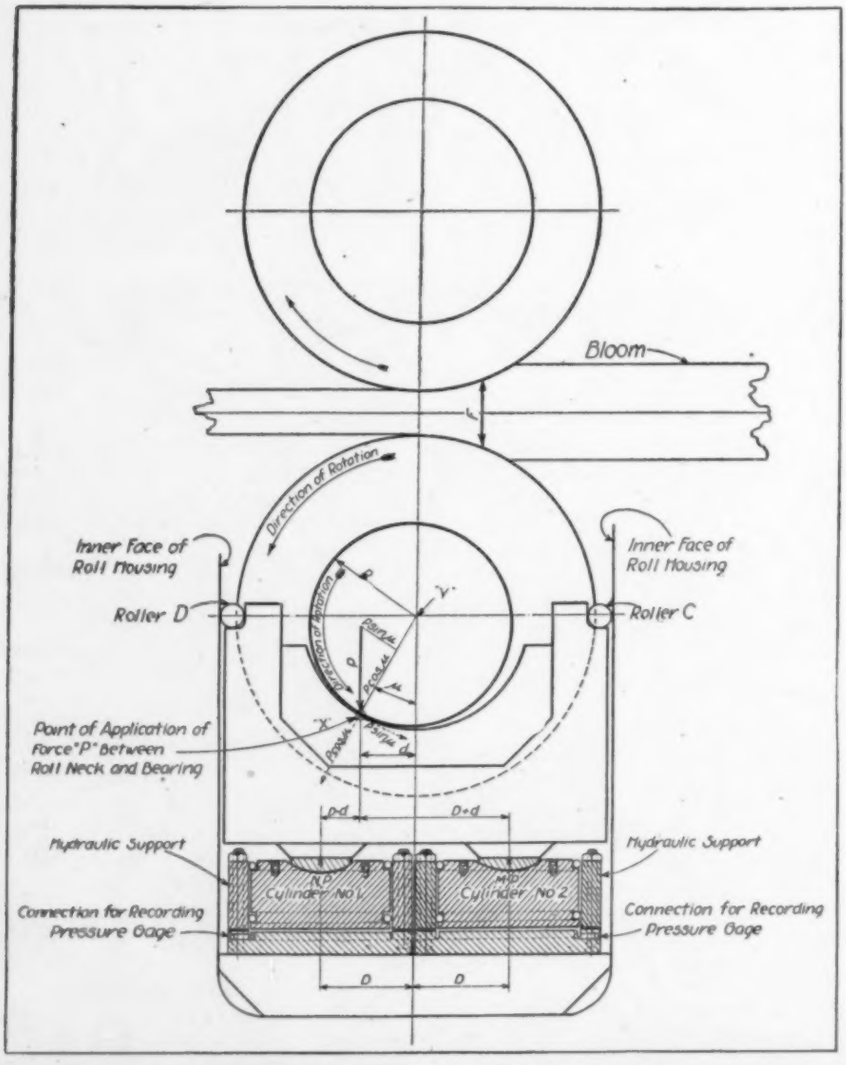


DIAGRAM OF FORCES ON HYDRAULIC SUPPORT CYLINDERS OF EXPERIMENTAL ROLLING MILL

plicated balancing and weighing mechanism. The hydraulic support was made accessible to general use by the research work of Dr. A. Martens at the German government materials testing station, who measured the pressure in the hydraulic support by means of Bourdon pressure gages and who proved conclusively that the combination of hydraulic support and pressure gage forms the most accurate and desirable means for measuring, without friction or lost motion, forces of any magnitude and of any suddenness of application.

Constructing New Cylinder

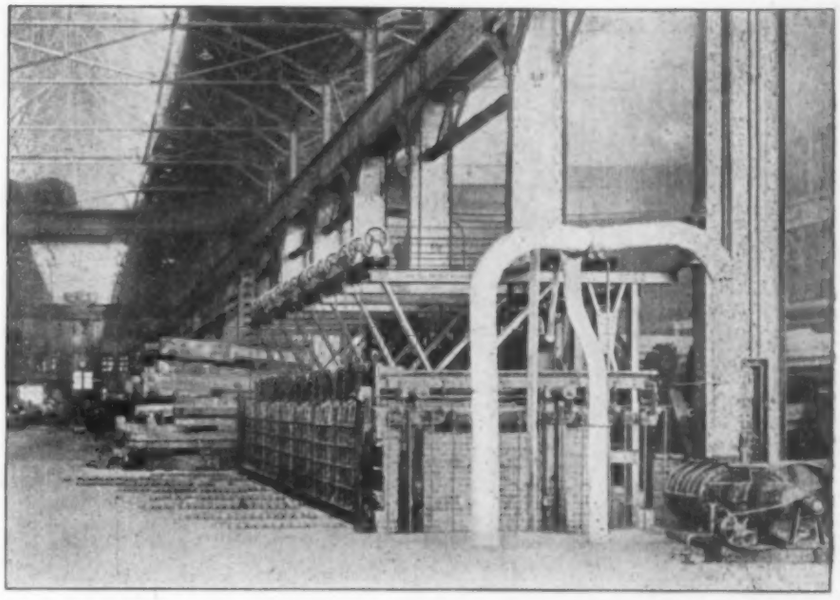
Application of cylinders of this type to roll neck investigation was considered sometime early in 1916 and drawings of a special roll housing were made for this purpose. Later the design was carried one step further by designing the present cylinders in such a manner that they would fit in the window of an ordinary roll or pinion housing, and could be replaced easily by a filler casting in case experiments not requiring their use were to be made.

At the present time the first cylinder of this type is in the course of construction and will be carefully tested and calibrated under a 600,000-pound compression testing machine before the final design is produced for the experimental mill. Diaphragms varying in thickness from 1/64 to 3/64 inches are on hand and their relative merits together with the relative merits of mercury or water for the fluid will be carefully investigated before the final selections are made.

A thrust plate is held firmly against the inside of the roll housing by bolts for unless a flexible connection between the lower roll carrier and this thrust plate were provided, it would offer a very substantial resisting force acting against the rotating tendency of the lower roll carrier. To overcome this the bolts are made with ball joints at their inner and outer ends. In this manner any retarding action due to the stationary thrust plate is avoided.

Much Work Lost in Friction

Importance of careful experiments on roll neck friction will be realized when, according to the best information at present available, between 40 and 50 per cent of the total work of a blooming or bar mill engine is absorbed in friction on the roll necks. These figures represent the best working conditions in rolling mill practice. For mills, such as plate, skelp or sheet mills rolling wide, thin sections, which are often cold, the work lost in friction on the roll necks is frequently between 70 and 80 per cent of the total work of the engine or motor. Designs of the experimental mills are being worked out with extreme care, which of necessity involves a slow rate of progress. They offer a great many problems similar to the one just described. It is expected that these designs will be completed some time during the next three or four months and will be given to the public very shortly thereafter.



REMOVABLE PARTITIONS PERMIT THE TREATING OF VARIOUS SIZES AND SHAPES OF STOCK AT THE SAME TIME

Designs Side Door Furnace for Heat Treating

Because of the variance in the size and shape of much of the material to be heat treated, the W. S. Rockwell Co., 50 Church street, New York, has developed a side-opening furnace which can handle a wide range of stock at the same time. The furnace, which is 36 feet wide and approximately 5 feet long, is divided into seven compartments, all or any portion of which may be thrown together.

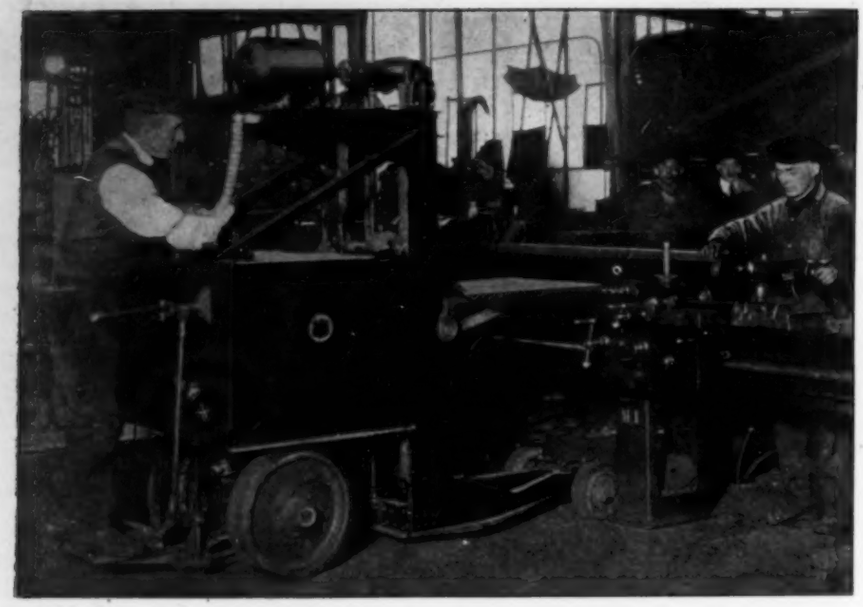
With such an arrangement small stock may be handled in one compartment while much larger stock can be accommodated in another. To further increase the range of work treated, the furnace now is being made in 105 feet widths, the length remaining the same. The doors, which also are sectional, can be raised independently of each other by compressed air and counterweights.

Flat tiles are used in the roof construction to avoid any arch thrust. Expansion of the brickwork or of the furnace as a whole is taken up by two heavy springs on the side of the furnace. The furnace is underfired and uses either fuel oil or gas. Spent gases circulate through preheaters and return to the burners, thereby conserving much heat which would otherwise be lost. Combustion takes place in a series of chambers located under the hearth, the hot gases from which pass into the heating chamber in such a manner as to insure a uniform application of heat to all parts of the furnace interior. Some of the gases in the heating chamber are siphoned back into the combustion chamber.

Young Engineers to be Encouraged

To encourage the younger men and to direct attention to the problems of the steel industry in the Middle West, Robert W. Hunt, president Robert W. Hunt & Co., Chicago, has set aside a fund of $5000, the income from which will be used as a prize to be awarded each year to the person, under 30 years of age, who presents before the Western Society of Engineers the best paper on the manufacture of iron and steel. The endowment was announced at a recent meeting of the society. A committee composed of three prominent engineers, one of whom must be a recognized authority in the iron and steel industry, will make the award annually.

Provision has been made that if no paper presented during the year is thought worthy of the prize, the income from the fund will be given to St. Luke's hospital, Chicago. A



THE LOAD PLATFORM ON THIS STORAGE BATTERY TRUCK CAN BE RAISED OR LOWERED AND HELD AT ANY HEIGHT UP TO 76 INCHES

further provision has been made to the effect that if no award is made for a period of five years, the principal will be turned over to the hospital and the trustees discharged.

New Industrial Truck Has Lifting Device

For carrying work about the shop and elevating it to the proper height for loading onto storage racks or freight cars, or for placing work in machines, the Lakewood Engineering Co., Cleveland, has developed a new industrial truck, which it is claimed, has the ability to perform all the functions of a tiering machine as well as those of a load carrying storage battery truck. Although possessing practically all the features of a load carrying vehicle, the truck has a lifting device capable of elevating a 2-ton load to any height up to 76 inches.

The load platform, as shown in the accompanying illustration, is carried by a cantilever support and is lifted by means of two steel worm screws geared to a motor used solely to operate the hoist. Ball bearings are used throughout to produce rapid and smooth elevating movement. By the use of specially designed skids, the truck can pick up material easily and, where the material will permit, stacks may be made of the material and the skids.

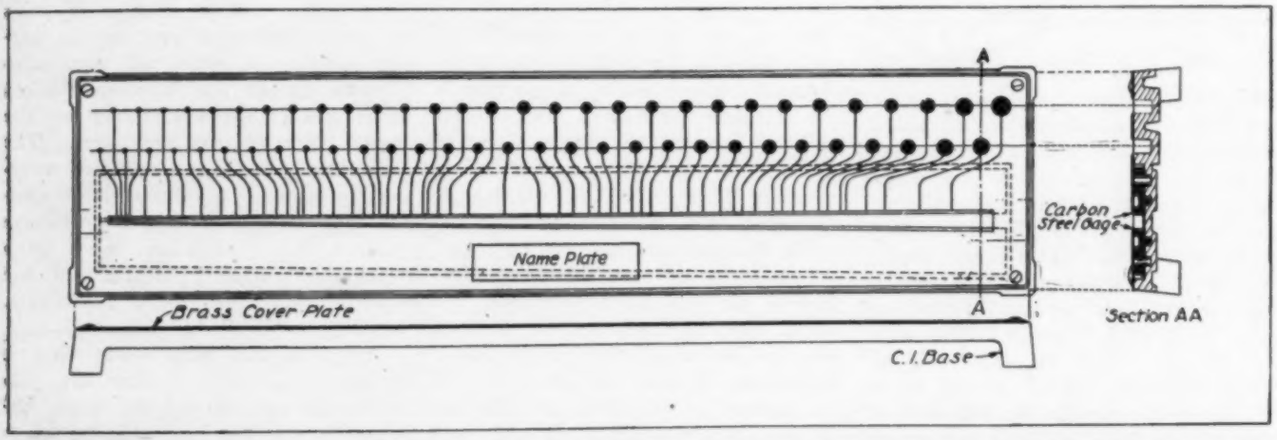
A four-wheel drive allows the truck to turn around in a circle 92 inches in radius. Speed of travel is simply controlled by a three-speed controller, the handle to which is within easy access to the operator, who stands on a step in the rear of the truck. The three speeds forward and reverse give great flexibility of movement. Operation of the lifting mechanism is by a small individual controller which permits only one speed in either direction.

V-Gage in Drill Holder Identifies Sizes

A novel drill holder designed to facilitate the return of drills to convenient receptacles after use by quickly identifying their sizes has been developed by Russel & Burr, Philadelphia. The device is particularly adapted to use in tool rooms and machine shops where it is essential that drills be classified according to size and that the time consumed in returning used drills to their respective holders be reduced to the minimum.

The holder consists of a cast iron base, a hardened steel V-gage with ground edges, and a brass cover plate. Paralleling the V-gage are two rows of holes drilled to accommodate a full set of drills, as for instance those ranging from No. 1 to No. 60, Brown & Sharpe gage. Guide lines on the cover plate lead from points at the edge of the V-gage to the drill holes. In order to replace a drill, it is only necessary to slide it into the V-gage, note where it comes to rest, and trace the line on the cover plate from this point to the indicated hole, which is the proper receptacle for the drill.

When a drill of a known size is desired, it may be found by referring to the numbers or sizes which are stamped alongside each hole. In case it is desired to select a drill for a hole to receive a cylindrical piece which is available, this piece may be inserted in the V-gage, and the proper drill readily ascertained by following the line from the point of rest as heretofore explained. The arrangement of the parts of the holder is shown in the accompanying drawing.



DRAWING OF NEW DRILL HOLDER SHOWING CAST IRON BASE, HARDENED STEEL V-GAGE, AND BRASS COVER PLATE WITH GUIDE LINES TO DRILL RECEPTACLES

New Sheet Bar Mill Now Rolling

In New Equipment of Sharon Steel Hoop Co. Ingots are Broken Down on Reversible Blooming Mill—Manipulator and Tilting Fingers Built in Combination—Breaking Spindle Interposed Between Pinion and Motor Shaft

SINCE the Sharon Steel Hoop Co. in 1917 acquired the steel works of the Youngstown Iron & Steel Co., at Lowellville, O., about 10 miles east of Youngstown, two new 75-ton open-hearth furnaces have been laid down. This gives the company six open-hearth furnace units with an annual steelmaking capacity of 300,000 tons. In order to take care of the increased ingot production the company added a four-hole soaking pit, a blooming mill and a 21-inch slab and sheet-bar mill. These new mills will take the place of the 30-inch bar mill and the 24-inch universal mill which were built in 1915 by the Youngstown Iron & Steel Co.

The new open-hearth furnaces are similar in design to those already in operation at the plant. They are equipped with electrically-operated door-lifts and with valves built by the Blair Engineering Co., Pittsburgh. Additional charging and tapping equipment also was included in the new construction, the charging machine and the 150-ton traveling crane having been built by the Morgan Engineering Co., Alliance, O. Gas for melting the open-hearth charges is supplied by Morgan-type producer gas machines. Each of the new furnaces is served by three producers when gasifying a low-grade coal; two are used when a good grade of coal is on hand, the third producer then being held in reserve as a spare. Storage bin capacity also was increased in the stock house department. The new concrete bins are so arranged that the raw materials are dumped directly from the railroad cars into the various compartments. Stock from these bins is discharged into a grab bucket suspended from an overhead crane, and then loaded into the various charging boxes. The latter are brought into the stock yard over standard gage railroad tracks which are laid so that the crane spans them.

Rolls Have Spread of 28 Inches

The 34-inch blooming mill, which is a two-high reversing type, was built by the MacIntosh-Hemphill Co., Pittsburgh. The approach side of the mill is shown in Fig. 6 and the delivery side in Fig. 1. The rolls are 30 inches diameter and 72 inches long. The upper roll has a lift of 28 inches and is elevated or lowered by means of screw-downs which are operated by two motors connected in series. The screw-down is of the hydraulic balanced type. All mill tables are equipped with cast steel rollers and gears. The latter have cut teeth and operate in oil. All tables are motor driven. The feed rollers are driven by extensions from the table side shafts, making one continuous drive for each side of the mill. Universal couplings are used throughout the mill in order to take up any backlash when the rolls are reversed.

The manipulator is of special design and has no racks or mechanism underneath the tables. The mill is provided with tilting fingers on the approach side only and differs from other blooming mill installations inasmuch as the majority of mills of this type are equipped with tilting fingers on both sides of the roll stand. A feature of the tilting fin-

FIG. 1—DELIVERY SIDE OF THE 34-INCH BLOOMING MILL. MANIPULATOR EQUIPMENT IS PROVIDED ON THE APPROACH SIDE OF THE MILL ONLY

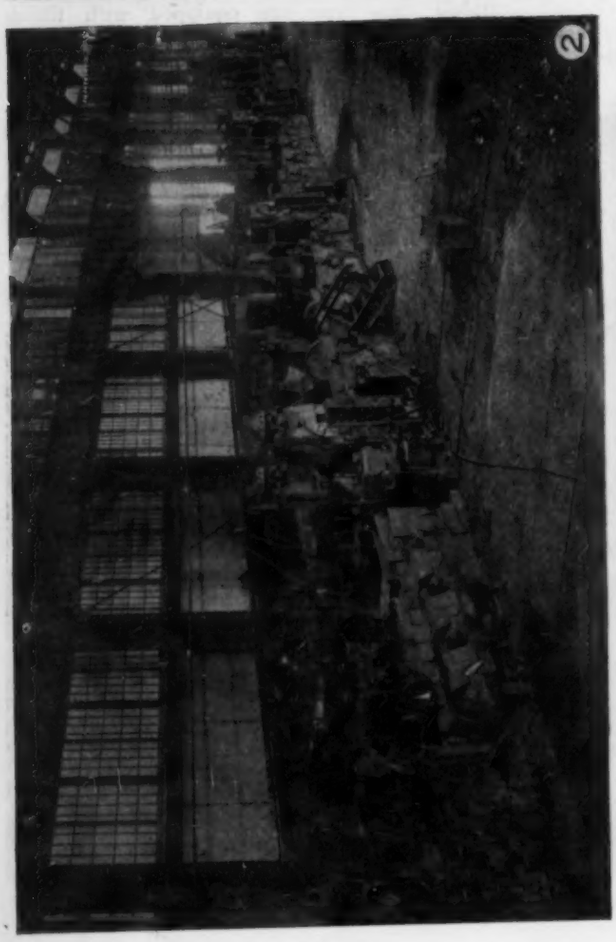


FIG. 2—DELIVERY END OF THE 21-INCH CONTINUOUS SHEET-BAR MILL. FLYING SHEAR IS SHOWN AT THE EXTREME LEFT. FIG. 3—SKEW-TYPE ROLLER TABLE AND ASSEMBLY TABLE. PILING ROLLS ARE SHOWN NEAR THE STEPS LEADING TO THE OPERATOR'S PULPIT. FIG. 4—ALL HERRING-BONE GEARS, WHICH DRIVE THE VARIOUS STANDS OF ROLLS, ARE ENCASED AS A SAFETY MEASURE. FIG. 5—RECEIVING END OF THE 21-INCH MILL. THE FIRST STAND OF EDGING ROLLS IS SHOWN AT THE END OF THE ROLLER TABLE

gers is that they are built in combination with and hang from a side guard. When the latter is raised by means of a tilting cylinder, which is alongside the table beams the tilting fingers catch the piece and turn it over. The manipulator is self-contained except on the pusher side where the end of the pusher bars are carried on the table beam.

The blooming mill rolls are driven by a 9000-horsepower reversing direct-current, 700-volt motor. The latter is capable of operating at a speed varying from one to 100 revolutions per minute, and of delivering 1,000,000 foot-pounds torque at 47 revolutions per minute. The motor is designed to withstand the peaks encountered when reversing the rolls, a thrust bearing being provided to protect it from the severe mechanical shocks of the mill such as the breaking of a spindle. The driving unit is provided with artificial ventilation, the induction motor which drives the blower being so interlocked with the main direct-current breaker in the reversing motor circuit that the breaker cannot be closed unless the blower is in operation. The reversing motor is controlled by a master switch which is located in the mill operator's pulpit. Once the flywheel set is brought up to speed and the main circuit breaker closed, the reversing motor is controlled almost entirely from the pulpit.

The reversing motor receives its power from a 2250-kilowatt, 700-volt, direct-current, shunt-wound generator designed to withstand the same peak load as encountered by the reversing motor. The generator is driven by a 1500-horsepower, alternating-current motor. The latter is designed to operate on a 3-phase 2200-volt, 60-cycle circuit and is of the wound-rotor type. A 60,000-pound flywheel is mounted on the same bedplate with the motor and generator set, and between the two units. The flywheel is enclosed completely with a sheet-iron cover in order to reduce the windage losses and also to afford protection to the operator. The flywheel set bearings of this set are water-cooled as an emergency measure.

A liquid slip regulator limits the peaks and equalizes the input to the flywheel set. When the load on the alternating-current motor reaches a predetermined value, the regulator introduces resistance in the secondary winding which causes the motor speed to decrease, thereby allowing the flywheel to give up some of its stored energy and to absorb the peak loads. When the peak load goes off, the regulator cuts out the resistance in the secondary winding and thus brings the flywheel back to full speed. The regulator is so arranged that the alternating-current motor cannot be started until the maximum resistance is inserted in the secondary winding by means of the regulator being wide open. The switching of the alternating-current motor is so arranged that the flywheel set can be brought to a standstill within a short period of time by opening the forward primary oil breaker and closing the reverse primary oil breaker.

As the semifinished material leaves the blooming mill it passes to a 10 x 10-inch vertical-geared bloom shear where the ends are cropped. The shear approach table is motor driven and fits between the shear housings. The shear delivery table is so designed that the tilting and stationary sections may be moved about 3 feet away from the shear to allow the crop ends and small slabs to drop on a chute which discharges into a scrap box. The table is moved in and out and also tilted by means of hydraulic cylinders.

FIG. 6—APPROACH SIDE OF THE 34-INCH REVERSIBLE BLOOMING MILL AT THE PLANT OF THE SHARON STEEL HOOP CO., LOWELLVILLE, O.

After the piece is cropped it is forwarded over a roller table to the 21-inch continuous slab and sheet bar mill which was built by the Morgan Construction Co., Worcester, Mass. This mill rolls the product from the blooming mill into sheet bars, 8 inches wide, in weights from 6 2/3 to 46 pounds per foot, and into 12-inch sheet bars from 10 pounds per foot upwards. The mill also rolls edged slabs, 2 inches thick and 7½ to 16 inches wide. Slabs of these specifications are shipped to Sharon, Pa., where they are rerolled at the company's strip steel department.

The capacity of the tandem slab and sheet bar mill is limited only at present by the supply of hot steel from the blooming mill. However, its ultimate capacity can be developed up to

100 tons per hour. The ingots are broken down on the blooming mill into slabs 2 inches thick and 8 to 12 inches wide for sheet bars, and of a predetermined width for edged slabs that are intended for hot strip steel.

Advantage of Edging Rolls

The 21-inch mill, which is shown in Figs. 2 and 5, includes five stands of horizontal rolls and three stands of power-driven vertical edging rolls. The use of the edging rolls precludes the necessity for tongue and groove passes and permits the rolling in the entire range of product on the same plain cylindrical rolls. In other words, no roll changing is required to obtain the full range of sections for which the mill is designed. The vertical rolls, No. 1 stand of which is shown in Fig. 5, also render it possible to produce sheet bars and slabs accurate in width and with rolled edges. When sheet bars are going through the mill, the first and second edging passes are used and free vertical loops are thrown after the second, third and fourth horizontal passes. When slabs are on schedule, the second and third edging passes are used. After the second pass, the tandem rather than the continuous method of rolling is followed, that is, the piece is given dummy passes.

A 4000-horsepower, slip-ring induction motor drives the 21-inch mill. The motor takes power at 2200 volts and has a rated speed of 360 revolutions per minute. The driving unit was built by the General Electric Co., Schenectady, N. Y.

A reducing gear unit is interposed between the mill and the driving motor. This unit was built by the Morgan Construction Co., Worcester, Mass., and is known as the built-up herringbone type. The two halves of the gear ring are bolted to a permanently shrunk and keyed gear center which remains in place on the gear shaft during the life of the gear unit. By means of this construction the gears can be replaced without disturbing the gear center. The bearings on the gear unit are of the chain oiled type. The gears are enclosed in oil-tight horizontally split gear casings, the latter being so arranged that the gear is readily accessible for examination. A small heavy stressed breaking spindle is interposed between the pinion and motor shaft in order to definitely limit the stresses in the reducing gears and in the mill transmission gear and shafts. The pinions are cut from solid high-carbon steel forgings. The two halves of the pinion are machined separately and have their teeth cut before they are shrunk on the pinion center.

Immediately following the 21-inch mill is an Edwards-type flying shear, which is shown at the extreme left in Fig. 2. This shear makes a cut without checking the progress of the finished sheet bar, which at times leaves the last stand of rolls at a speed of 600 feet per minute. After the sheet bar has been cut into 30 to 35-foot lengths it passes over a skew table to the bar piling rolls which stack them in the piling bin. The latter is equipped with adjustable sides so that any widths up to 15 inches can be piled in stacks up to 30 inches high for convenient handling by the crane.

The skew assembling table, which is provided with a disappearing stop, is used when the mill is rolling slabs. The latter are assembled in batches on this table and then are pulled onto the cooling bed by a traveling straight edge. The skew and assembly tables are shown in Fig. 3. The 21-inch mill has been built so it can be used later as a roughing mill for supplying stock to an 18-inch continuous sheet bar and billet mill. When the latter is installed, the present unit will not produce sheet bars, but will deliver 2-inch slabs to the 18-inch mill, which in turn will roll them into sheet bars. Under this arrangement the blooming mill will supply 6-inch slabs to the 21-inch mill instead of 2-inch slabs as is the present practice, thus reducing the number of passes and considerably increasing the production of the mill.

Prices Rise

In Fire Clay and Silica Brick—Furnaces Under Contract

Pittsburgh, Jan. 6.—Fire clay and silica brick for second quarter shipment have been advanced $5 per 1000 over the prices which have ruled the past eight or nine months by leading Pennsylvania and Ohio manufacturers. Because of the increased fuel and labor costs, the advance promises to become general throughout the country before long. The new prices will hardly become effective before April 1, for the reason that most blast furnace interests are protected by contracts, against which they could not accept shipments during the last quarter of 1919, owing to the scarcity of common labor at the steel and iron works and the fact that the railroad administration, because of that situation, set up plant embargoes, which were not lifted until the strike of the workmen was practically over.

Deliveries against these orders meet the requirements of the present quarter for blast furnace stoves and linings. Specifications against contracts now are as heavy as they were light recently and with the steady reduction in warehouse stocks plant operations have risen sharply. The industry as a whole now is averaging close to 75 per cent of capacity, as against less than 40 per cent, during the early part of the steel plant strike, when only actual requirements were being ordered forward and no brick were being stocked, as they would have been if labor was available in numbers sufficient to handle the shipments. No change is noted in the prices of magnesite, chrome or bauxite brick, but these grades are firm, especially the first-named, production of which still reflects the scarcity of magnesite.

Refractories

(Per 1000 f.o.b. works)

FIRE CLAY BRICK (First Quality)	
Pennsylvania	$36.00 to 45.00
Ohio	36.00 to 43.00
Kentucky	36.00 to 41.00
Illinois-Missouri	30.00 to 40.00
FIRE CLAY BRICK (Second Quality)	
Pennsylvania	$30.00 to 40.00
Ohio	20.00 to 30.00
Illinois-Missouri	25.00 to 30.00
SILICA BRICK	
Pennsylvania	$40.50 to 50.00
Chicago	45.50 to 55.00
Birmingham	46.50 to 51.50
MAGNESITE BRICK (Pet Net Ton)	
9 x 4½ x 2½	$80.00 to 85.00
CHROME BRICK (Pet Net Ton)	
9 x 4½ x 2½	$80.00 to 90.00
BAUXITE BRICK (Pet Net Ton)	
55 per cent	$ 40.00 base
76 per cent	100.00 base

Reviews History

In its holiday dress, *The Forge*, house organ of the Pollak Steel Co., Cincinnati, carries the company's greetings and best wishes in an attractive manner to its employes and friends. In this particular issue is published an interesting history of the company from the time it occupied a small building at the corner of Front and Water streets in 1865. Started as a partnership, the business growth of Block & Pollak has been continuous. At present the company owns and operates three plants, one in Cincinnati, one in Marion, O., and one in Chicago, and conducts sales offices in every principal city of the United States. Emil Pollak is president; Maurice E. Pollak is vice president; Bernard E. Pollak, treasurer and general manager, and Julian A. Pollak is secretary.

Pig Iron Makes Big Increase

Tonnage Produced in December Shows Large Gain in Spite of Fuel Shortage—Industry Has Completely Recovered From Steel Strike as Shown by Stacks in Blast on Dec. 31

IN SPITE of the coal strike which curtailed operations for several weeks during December, coke and anthracite pig iron production, continuing the recuperation of November, made a big increase and brought to a close a year marked with wide fluctuations in production. Although the gain was not as large as that registered in the preceding month, it is just as significant in that it was made in the face of a most serious coal and coke shortage.

The total production for December was 2,629,850 tons, an increase of 222,481 tons over the November total of 2,407,369 tons. On the basis of average daily production, December set an average pace of 84,834 tons per day or a gain of 4590 tons over the 80,244-ton rate of the previous month. This is a gain of 5.72 per cent while the November gain was 32 per cent. The December average daily record passed the September figure by 2142 tons but is still 3619 tons less than the August figure, the highest point since March, 1919.

AVERAGE DAILY PRODUCTION

	1919	1918	1917	1916	1915
Jan.	106,654	77,523	101,930	102,319	51,323
Feb.	105,270	82,794	94,641	106,157	59,521
March	99,614	103,548	105,026	107,343	66,009
April	82,479	109,112	110,936	107,517	70,484
May	67,991	111,351	110,119	108,535	72,747
June	70,467	110,538	108,675	107,127	78,998
July	78,200	109,954	107,659	103,907	82,687
Aug.	88,453	108,983	104,483	103,156	89,510
Sept.	82,692	113,774	104,691	106,935	94,478
Oct.	60,142	112,335	106,332	113,167	100,656
Nov.	80,244	111,595	106,620	110,593	101,174
Dec.	84,834	110,602	93,077	102,715	103,278
Av.	83,920	105,293	104,562	106,610	81,022

As the result of poor market conditions during the early part of the year and the disturbed labor conditions during the latter part of the year, the total production for 1919 is considerably lower than for the two preceding years. For the first six months the total was 16,037,988 tons and for the last six months the total was 14,548,726 tons, giving a grand total for 1919 of 30,586,714 tons. The grand totals for the years 1918 and 1917 were 38,437,488 tons and 38,164,976 tons respectively.

Nonmerchant or steelworks stacks in December produced 1,925,449 tons of the total and showed a gain of 164,695 tons over the November total of 1,760,754 tons. Considered on a daily basis, this output represented 62,111 tons per day compared with the 58,691 tons of the previous month, a gain of 3420 tons per day. This is an increase of 5.8 per cent. Merchant output for December was 686,950 tons, an increase of 61,025 tons over the November output of 625,925 tons. Reduced to a daily basis this is 22,159 tons per day compared with 20,864 tons in November, a gain of 1295 tons or of 6.2 per cent. Largest gains in the nonmerchant production and those which were responsible for the improved showing made during the month were recorded in the Johnstown, Pa., and Youngstown, O., districts.

Number of Active Stacks Increased

Stacks in blast on Dec. 31 totaled 262. This is a gain of 10 stacks over the 252 active on the last day of November. Of this net gain, merchant stacks are responsible for all but one stack, 14 stacks of this class having been lighted and five blown out. Of the steelworks stacks, nine were lighted and eight blown out. The stacks in blast on the last day of December number only one less than on Aug. 31, indicating that the pig iron capacity of the country has again reached the point where it was when overtaken by the steel strike.

Spiegeleisen production with 4508 tons was practically the same as in November when 4500 tons were produced. Ferro, on the other hand, with only 12,943 tons showed a drop of 3247 tons from the November figure of 16,190 tons.

Daily average production for 1919 was 83,920 tons. For 1918 the corresponding figure was 105,293 tons; for 1917, 104,562 tons; for 1916, 106,610 tons, but for 1915 it was only 81,022 tons.

MONTHLY PRODUCTION

	1919	1918	1917
January	3,306,279	2,403,227	3,159,839
February	2,947,555	2,318,242	2,649,935
March	3,088,023	3,209,996	3,255,813
April	2,474,374	3,273,355	3,328,061
May	2,107,729	3,451,884	3,413,677
June	2,114,028	3,316,148	3,260,234
Total 1st half.	16,037,988	17,972,852	19,067,559
July	2,424,212	3,408,584	3,337,442
August	2,742,081	3,378,479	3,238,970
September	2,480,790	3,413,223	3,140,742
October	1,864,424	3,482,392	3,296,286
November	2,407,369	3,347,844	3,198,597
December	2,629,850	3,434,114	2,885,380
Total 2d half..	14,548,726	20,464,636	19,097,417
Grand total..	30,586,714	38,437,488	38,164,976

The blast furnace of the Intermont Coal & Iron Corp., Big Stone Gap, Va., which has been out of blast since June 1, has been modernized with an improved top, a skip hoist and complete electrical equipment. Operation probably will be resumed on Feb. 1.

The Lochiel stack of Edward E. Marshall, Lochiel, Pa., which blew out last March was expected to blow in early in January. During the time out of blast, the furnace was relined, new downcomers, dust catchers and gas mains installed and the entire plant thoroughly overhauled.

DECEMBER PIG IRON

States	No. of Stacks	No. in blast last day in month: Dec.	Nov.	Total tonnage made: Merchant	Nonmerchant	Totals: Dec.	Nov.
Pennsylvania	169	113	112	211,486	922,726	1,134,212	1,084,354
Ohio	79	52	48	137,926	445,801	583,727	442,906
Alabama	45	22	23	107,919	92,752	200,671	184,013
Virginia	19	6	6	18,186	.....	18,186	22,653
New York	28	15	16	68,705	65,878	134,583	130,937
New Jersey	5	0	1	3,732	.....	3,732	5,000
Illinois	25	16	13	41,831	156,306	198,137	198,258
Colorado	0	0	0				
Indiana	16	13	11	37,233	203,582	240,815	237,469
Maryland	4	4	4				
Wisconsin	6	3	3				
Kentucky	7	4	4				
Tennessee	16	7	5	35,691	14,076	49,767	42,994
West Virginia	5	2	1				
Washington	1	0	0				
Georgia	2	0	0				
Texas	1	0	0				
Minnesota	3	3	3	24,241	24,328	48,569	38,095
Michigan	3	2	2				
Missouri	1	0	0				
Spiegel—All states	..	..	..	.....	.....	4,508	4,500
Ferro—All states	..	..	..	.....	.....	12,943	16,190
Totals	432	262	252	686,950	1,925,449	2,629,850	2,407,369

Tariff Board Reviews Metals

Conditions in Manganese, Magnesite and Tungsten Are Set Forth—Domestic Magnesite Supply Pronounced Ample But Industry is Handicapped by Long Transportation Haul—Relapse Through Austrian Competition Feared

WASHINGTON, Jan. 6.—During the fiscal year ended June 30, 1919, approximately 60 tariff information catalogs were completed covering a wide diversity of raw material and manufactured products of iron and steel and nonferrous metals, according to the third annual report of the United States tariff commission. Early in the year particular consideration was given to those metal and chemical industries that were seriously disturbed or greatly expanded by war conditions.

The commission had planned and nearly completed a volume on "The Mining Industries," especially relating to war minerals, but did not have sufficient funds to print it. The preparation of this volume is again under way. As now outlined, it will contain industrial surveys dealing with magnesite, tungsten, graphite, barytes, manganese, chromite, antimony, quicksilver, potash and pyrites. A similar volume covering the ferroalloys has also been planned and its publication will follow the completion of a field investigation of the ferroalloy industries.

Discussing the situation respecting tungsten-bearing ores, the report says the mechanical treatment of low grade tungsten ore has reached its highest development in the United States. American mills are declared to be better equipped than those in foreign countries and obtain a more nearly complete extraction. The Atolia Mining Co., of California is credited with being the largest producer in the United States and its output constituted over 30 per cent of the total domestic product in 1913. Over 50 per cent of the tungsten mined in the United States is taken out by four large companies.

Domestic production of tungsten ore furnished less than one-third of the domestic requirements in 1918, when the output totaled 5041 short tons. Previous to the war about 75 per cent of the domestic supply came from American mines, but consumption has increased more rapidly than production. In general, it is stated, costs of foreign production, even including freight to the United States, are reported lower than costs of production in the United States.

Extreme fluctuations in prices have characterized the tungsten ore market. There was a general advance in price from about $2 a unit in 1900 to a little more than $7 in 1914, the report says. In the winter of 1915-16 there was a "boom" in tungsten. In a period of about six months the price soared to more than $90 a unit. Then followed, within less than three months, a fall to $25, and later to $18. After September, 1916, the price remained between $18 and $26, averaging about $22 a unit, until its drop to $7 or $8 in 1919.

Discussing the magnesite situation, the report says that about 82 per cent of the domestic consumption is used in refractories, 15 per cent in the plastic trades and the remainder is required for minor uses in chemical industries and in medicine. The United States is the largest consumer of magnesite in the world, its consumption in 1913 having been 50 per cent of the total output of the world. Before the war fully 90 per cent of the domestic supply was imported. Austria-Hungary furnished the bulk of the material required by the steel industry from deposits controlled by American capital. This supply was cut off at the outbreak of the war while at the same time domestic requirements increased greatly. In 1917 the domestic consumption was over 350,000 tons, valued at more than $3,700,000. Nearly 90 per cent of the supply was of domestic origin and a great new industry was developed in Washington, while the existing industry in California was greatly expanded.

The chief handicap of the domestic magnesite producer is said to be the long railroad haul from the mines to the eastern markets, where most of it is consumed. Domestic reserves are said to be ample, especially in Washington, where more than 7,000,000 short tons are indicated or in sight. They are being worked by two or three strong companies and several small operators, the report says.

It is stated that the American magnesite is purer than the Austrian material, which by virtue of its content of a small amount of iron is better suited for use in the steel industry. However, the early difficulties encountered in the use of domestic material have been quite satisfactorily overcome. The lack of the desired amount of iron in Washington magnesite is met by adding iron synthetically.

"With the return of normal shipping conditions," it is said, "the American magnesite industry faces the prospect of a serious relapse, almost to the prewar level. Recently developed deposits in Venezuela may be expected to furnish some material to the eastern markets in competition with that from Greece and Cañada, but Austrian magnesite will dominate the market, if delivered at anything like prewar prices, which were as low at the Atlantic seaboard, practically the point of consumption, as quotation of the domestic product on the Pacific coast."

Concerning the manganese ore mining industry, the report says that domestic production of high grade ore, 35 per cent or more manganese, increased from 4048 tons in 1913 to about 305,869 tons in 1918. Production of low grade ore increased from 59,403 tons in 1913 to 1,170,382 tons in 1918. The number of mines increased from 75 in 1917 to 325 in 1918. The quantity imported from Cuba shows annual increases from 550 tons in the fiscal year 1915 to 67,780 tons in 1918, an amount equal to one-twelfth of our total imports. The United States became independent of British ferromanganese and of Indian and Russian ore.

Progress Made in Beneficiating Ores

WASHINGTON, Jan. 6.—The bureau of mines is now conducting 11 mining experiment stations, located in the various mining centers of the country. So great has been the demand for knowledge concerning the character of the work undertaken in various localities and its general relation to the mining industry, that the bureau has issued a bulletin describing it.

Dr. Van H. Manning, director of the bureau, sketching the work of the stations, says the vastness of the deposits of low-grade ores being made

available through the experiment stations is shown by the work assigned to the station at Minneapolis. The primary purpose of this station is to devise methods of utilizing low-grade iron ores. It has been estimated that the reserves of low-grade magnetic iron ores in Minnesota amount to some 40,000,000,000 tons, but until recently these ores were untouched because no process of treating them profitably was devised. Even now, it is stated, only one company is attempting to utilize them. The Minneapolis station has demonstrated that it is possible from a metallurgical standpoint to utilize the great deposits of manganiferous iron ore on the Cuyuna range.

"Work such as this not only stimulates mineral production and helps to make available tremendous resources that are now unused, but it increases the total wealth of the nation and ultimately benefits every citizen" says Dr. Manning.

"The mining industry is so related to commerce and manufacture that the importance of publishing the results of technical investigations of mining problems is becoming more and more evident. The miner and the mine operator are integral parts of the industrial system of the country and each needs to keep in close touch with what the government is doing through the mining experiment stations of the bureau of mines.

In the West vast quantities of low-grade complex ores will become available as soon as commercially feasible processes are devised. Many of the problems involved, which are being attacked at the Golden, Colo., station, the Salt Lake City, Utah, station, the Seattle, Wash., station, the Tuscon Ariz., station and the Berkeley, Cal., station, are of such a nature that the small operator cannot afford to attack them, and the large operator finds them outside his field. Yet the solution of any one of them may add greatly to the available resources of the country and may result in establishing a new industry that will build up the district in which it is situated Already these stations, although young, have witnessed such results."

It is stated that the Salt Lake City station has devised novel methods of treating certain low-grade and complex ores of lead and zinc. These methods show a large saving of metal over methods hitherto employed, and have made available ores that other methods could not treat profitably.

The Seattle station is busy with the beneficiation of the low-grade ores of the Northwest and the mining and utilization of the coals of the Pacific stations; the Tucson station is working on the beneficiation of low-grade copper ores; and the Berkeley station has shown how losses may be reduced at quicksilver plants and how methods at those plants can be improved.

Some of the more important accomplishments in the coal mining industry have been the development and introduction of permissible explosives for use in gaseous mines the training of thousands of coal miners in rescue and first aid work, the conducting of combustion investigations aimed at increased efficiency in the burning of coal, and the effective use of the great deposits of lignite and low grade coal.

"In the conduct of the investigation the bureau seeks and is obtaining the co-operation of the mine operators," Dr. Manning says, in referring to work done in the western stations. "At more than a dozen mills in the West engineers from the stations are working directly with the mill men on various problems, and the results they already have obtained more than warrant the existence of the stations. Success in solving one problem may easily be worth millions to the country. Mining men are using these stations more and more freely as they realize that the government maintains these stations to help them, and that the difficulties of the operators, both large and small, will receive sympathetic consideration and such aid as the stations can give."

Way Opened For Schools to Get Tools

Washington, Jan. 6.—The war department is now prepared to negotiate with educational institutions for the sale of surplus machine tools, according to an announcement by the director of sales who has completed plans under the provisions of the Caldwell bill. Under this act schools properly accredited may purchase its requirements from the government surplus at 15 per cent of the original cost to the war department.

In making purchases, school authorities must fill out questionnaires from which will be determined the school's eligiblity to the advantages afforded in the measure. Together with this questionnaire must be submitted statements of the approximate number and kinds of machines required. Eligibility will be determined by the director of sales who will notify the school authorities, sending a coupon for each machine allotted to each institution.

War department bureaus also will be notified to place the name of the eligible institutions on a mailing list of the machine tool bulletins issued by the department. From these bulletins the schools can make their selections. Under this plan the schools will be given no preference over commercial institutions which will continue to buy under present plans, but the educational organizations will be given 10 days' options. Certified check and coupon must accompany the order for each machine. Freight is to be paid by the schools making the purchases.

Railroad Buying Depends on New Legislation

Washington, Jan. 6.—The proclamation of President Wilson returning the railroad to private control March 1 has led to discussion of what the carriers may do in the way of coming into the market in 1920 for equipment. Estimates have been made by the railroad administration that they will be required to spend from $750,000,000 to $1,000,000,000 next year for various equipment, additions and improvements. It is said that the lines will require 200,000 cars, great tonnages of rails, structural steel, track equipment, etc.

Whether the lines will soon enter on a large buying program depends to a great extent on the adequacy of pending railroad legislation. It is pointed out that if the carriers are to be put in first class shape they must have the money to do so, must be allowed to continue some of the consolidations and unifications brought about under government control, and also must be accorded liberal treatment by the interstate commerce commission. It is contended by railroad interests that higher rates will be necessary and many shippers appear to approve of this, although others are strongly opposed to it.

Another factor in the ability of the railroads to purchase heavily, it is declared, relates to the prices of steel. Some steel producers who have been in Washington recently say that an increase in prices in 1920 is inevitable, while others say that if it is at all possible and is safe as a matter of economics it is desirable that prices be held down.

Western Export Rates to Remain Unchanged

Washington, Jan. 6.—The interstate commerce commission last week declined to change the export rate on steel shipments originating in the territory bounded by New York on the east and Colorado on the west going by way of Pacific coast ports. The decision dismissed the complaint filed by the Inland Steel Co. and other independent Chicago producers who sought a differential of 12.5 cents per 100 pounds over Pittsburgh. The finding may be attributed largely to war developments which showed the congestion of eastern ports and the nec-

essity of equalizing freight distribution through the Pacific coast ports.

The commission accepted the railroad administration's contention that the present, rail rate of 60 cents equally applicable to Chicago and Pittsburgh export shipments west, is the equalizing factor in making up the through rate from Pittsburgh to the Orient by way of New York. Pittsburgh has the advantage of Chicago or New York to the Orient shipments by 18 cents, but this is not unreasonable or unduly prejudicial, it is held, because the Pittsburgh district is the greater producer and it is desirable that at least as much Pittsburgh freight go to the Orient by way of Pacific ports as by way of Atlantic ports.

Prior to the elimination of export rates during the war, when Chicago had a 12.5 cent differential over Pittsburgh on Pacific export shipments, Chicago mills had a 5 cent advantage and earlier enjoyed a 10 cent differential. The independent producers also argued that the equalized rate was of a decided advantage to the United States Steel Corp., which has subsidiary companies in both districts. This contention was not accepted by the commission, however, the claim being that the Steel corporation was enjoying a natural condition of having mills in the two localities.

Siam Wants Bids on Rails

Washington, Jan. 6.—Thirty thousand metric tons, or approximately 29,000 gross tons of steel rails and accessories are needed by the railways of Siam according to the far eastern division of the bureau of foreign and domestic commerce. Bids are to be opened Jan. 31 and manufacturers interested are urged to make inquiry for further information at once, referring to the division's file No. FE-65.

Carolina Shipyard Sold to Fuller Company

The George A. Fuller Co. has purchased the shipyard of the United States shipping board, Emergency Fleet Corp., located at Wilmington, N. C., and is carrying on the operation of the plant beginning Jan. 1. The plant was built in 1918 by the Carolina Ship Building Corp., superintendent for the United States shipping board, Emergency Fleet Corp. The Carolina Ship Building Corp. contract included, in addition to the construction of the plant, the construction of twelve 9600 deadweight ton cargo steamships, equipped with reciprocating engines. The Carolina corporation was a subsidiary of the George A. Fuller Co., incorporated for the purpose of executing this contract.

Under the new arrangement the George A. Fuller Co. will complete eight of the 12 ships named in the previous contract for the Fleet corporation for a lump sum price and will build the remaining four of the ships for its own account for sale. The plant is located on the Cape Fear river, within three miles of the city of Wilmington, and on fresh water. There are four concrete ship ways, 450 feet in length. The plant is complete except for facilities for the manufacture of engines and boilers. This is the first of the United States government agency shipyards to be sold to private interests. The George A. Fuller Co. is the largest building contracting firm in the world.

Paul Starrett is president of the company, the officers in charge of the shipbuilding work will be: Lorenzo C. Dilks, vice president; Ralph Starrett, works manager; Henry Vogt, assistant secretary-treasurer; J. R. Preston, E. G. Glass, technical and supply managers.

Utah Project Planned

Development of an iron and steel project on a site on Utah lakes in Utah not yet determined will be carried on in a large way, according to a recent announcement of President A. C. Milner of the Milner Corp., Salt Lake City. Eventually blast furnaces are contemplated. "This plan has been made possible," said Mr. Milner recently, "by the compromise reached the middle of December by the governor and the state land board with the Milner interests whereby title to 5564 acres of coal land passes to the corporation for a consideration of $556,400." These coal lands will be developed in conjunction with the iron deposits in Iron county, also held by the Milner company. Coke for the blast furnaces will be made from the coal mined in Carbon county.

The coal mines and Utah valley are approximately 60 miles apart, while the iron ore is located about 240 miles distant. Financial arrangements now are in the hands of Pacific coast bankers and it is understood that Japanese interests will be represented in the project to some extent.

To Rebuild Stack

The Carnegie Steel Co. recently awarded to the Pennsylvania Engineering Works, New Castle, Pa., the contract for rebuilding its No. 2 blast furnace at Farrell, Pa. The rebuilt stack will have a daily output of 500 tons of pig iron as compared with 350 tons, the furnace's former capacity.

Tariff Board

Along Lines of American Commission Wanted in Canada

Toronto, Ont., Jan. 5.—The tariff question is receiving increased attention in manufacturing and commercial circles. The Canadian Manufacturers' association has sent a circular to its various branches, boards of trade and other commercial bodies, urging deputations appear before the government to ask that the proposed tariff commission be composed of others than cabinet ministers.

"It is difficult," says the letter, "to see how a committee of cabinet ministers in a brief tour could secure adequate information on which to base decisions vital to our national fiscal policy. Moreover such hearings, which would undoubtedly produce a mass of unpractical suggestions and unverified statistics from all sorts of tariff theorists and publicity seekers, would injure trade and undermine commercial confidence."

In place of a temporary tariff committee representing the government, the association favors the creation of a permanent tariff board, such as established in the United States and other countries. Some of the matters which the association believes that a committee of ministers could not cope with are difference in labor and other costs of production in competing with foreign countries; origin of raw material and its cost; specific and ad valorem duties, preferential tariffs within the British empire, and bargaining features of tariffs of all great trading nations used to open new markets.

The National Steel Car Corp., Ltd., recently incorporated, has taken over the plant, business and assets of the National Steel Car Co., Ltd., of Hamilton, Ont. The new company is purely Canadian and its president is R. J. Nagsi. It will continue the manufacture of railway cars and has now on hand two large orders, while negotiations for others are nearly closed. It is proposed to increase the capacity of the motor truck department so as to obtain a minimum output of 1500 motor trucks during 1920.

Three Associations Meet

Three mill supply associations will meet in joint convention at Atlantic City, May 17, 18 and 19, 1920. These are the National Supply & Machinery Dealers' association, the American Supply and Machinery Manufacturers association and the Southern Supply and Machinery Dealers' association. Headquarters for all three organizations will be at the Marlborough-Blenheim hotel.

Offer National Arbitration Plan

Members of President's Industrial Conference in Tentative Report Propose Adjustment Boards in Each of 12 Regions, and Supreme Industrial Tribunal in Which Public Would be Represented—Hearings on Plan to Begin Jan. 12

WASHINGTON, Dec. 30.—A national industrial tribunal, composed of nine members appointed by the President, with 12 regional boards of inquiry and adjustment, is suggested by the President's second industrial conference as a means of eliminating much of the industrial unrest now prevalent in the country. While the conference in its preliminary report claims this plan is "different from anything in operation elsewhere," it is somewhat similar to the proposed plan for full organization of the national war labor board when it was in existence. The plan is the unanimous proposal of the 16 men composing the conference and was offered in a tentative statement made public last week for criticism by the nation. The conference, which recessed Dec. 19, will reconvene Jan. 12 and at that time will take up the plan with such suggestions as may reach the members, with an idea of working out final recommendations.

The tribunal, composed of three employers named by the President upon suggestion of the secretary of commerce, three representatives of employes named by him upon suggestion of the secretary of labor, and three representatives of the public of the President's own choosing, all subject to confirmation by the senate, would in effect be the appellate body of the machinery which would be set up if the plan is adopted. Decisions of the tribunal would have to be unanimous, but in the event of its members failing to agree, majority and minority reports would be submitted for the benefit of the public.

Next in order in this plan, the conference proposes to create 12 industrial regions, conforming to the territorial outlines of the federal reserve system. In each of these regions there would be a chairman appointed by the President and a vice chairman appointed by the tribunal in the event such an appointment became necessary. When a dispute arose, the chairman would request each party to submit the case to a regional board of adjustment, consisting of the chairman, one representative chosen by each side to the dispute and two "unchallenged" members selected from two panels. Panels of employers and employes for each region would be prepared by the secretary of commerce and the secretary of labor, respectively, after conferences with employers and employes. The panels would have to be approved by the President. The employers' panel would be classified by industries, and the employes' by industries and crafts. The order of the names in the panels would be determined by lot.

Provides for Board of Inquiry

The submission of an industrial dispute to a regional adjustment board would not be compulsory, but refusal of either side to a controversy to submit it to the board whenever in the opinion of the chairman this was necessary would result in the constitution of a regional board of inquiry, consisting of the chairman, two members of each panel selected by him, and the representative of the side which agreed to adjustment. If neither side agreed to adjustment the board of inquiry consisting of four members as selected by the chairman and the chairman himself would proceed to make an investigation and submit its report to the public.

The decision of the regional adjustment board would have to be unanimous, or failing in this it could either submit the dispute to a regional umpire, whose decision would be final, or to the national industrial tribunal. Appointment of representatives of both sides to a dispute would constitute an agreement to continue the status that existed before he trouble arose pending adjustment.

"In the presentation of evidence each side shall have the right to present its position through representatives of its own choosing," the tentative report states.

The new sysem would not effect existing means for adjustment and conciliation, whether federal or state in their character, or established by mutual agreement of employes and employers. When disputes are submitted to the regional boards, umpires or the national tribunal they would have the right to subpoena witnesses, examine them under oath and require the production of any papers considered pertinent to the case at hand.

"The plan here proposed presents greater difficulties in application to certain public utilities than to competitive industry," the conference reports. "The continuous operation of public utilities is vital to public welfare.

"As the capital invested is employed in public use, so is the labor engaged in public service; and the withdrawal of either, with the result of suspending service, makes the people the real victim.

"The conference believes that a plan of tribunals or boards of adjustment and inquiry should be applied to public utilities, but in the adaptation of the plan two problems present themselves.

"First, governmental regulation of public utilities is now usually confined to rates and services. The conference considers that there must be some merging of responsibility for regulation of rates and services and the settlement of wages and conditions of labor. Such co-ordination would give greater security to the public, to employe and to employer.

"Second, is the problem whether some method can be arrived at that will avert all danger of interruption to service. These matters require further consideration before concrete proposals are put forward."

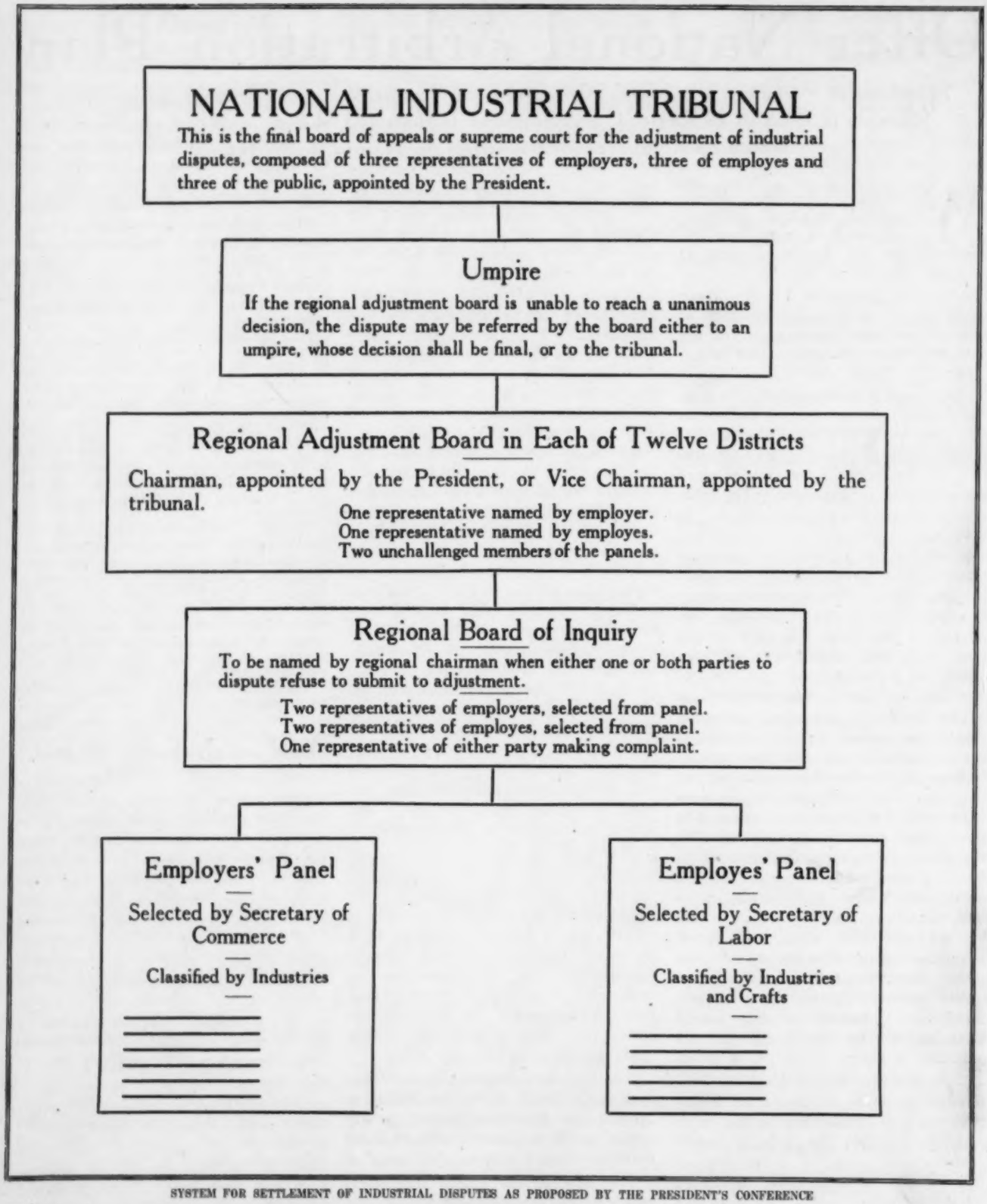
Government employes should have the right to associate for mutual protection, the conference further says, but "no interference by any group with the continuous operation of government functions through concerted cessation of work or threats thereof can be permitted." The conference affirmed that government employes concerned with the administration of justice or the maintenance of public safety or public order should not be permitted to affiliate with any organization which authorized the use of the strike.

"Legislation of the nation, the states and the municipalities," the conference said, "should be improved to prevent delay in hearings and to enable speedy action when there are grievances."

Discussing the labor situation in general, the conference states:

"Our modern industrial organization, if it is not to become a failure, must yield to the individual a larger satisfaction. Human fellowship in industry must either be an empty phrase or a living fact.

"Pending the growth of better relationship between employers and em-


NATIONAL INDUSTRIAL TRIBUNAL
This is the final board of appeals or supreme court for the adjustment of industrial disputes, composed of three representatives of employers, three of employes and three of the public, appointed by the President.
Umpire
If the regional adjustment board is unable to reach a unanimous decision, the dispute may be referred by the board either to an umpire, whose decision shall be final, or to the tribunal.
Regional Adjustment Board in Each of Twelve Districts
Chairman, appointed by the President, or Vice Chairman, appointed by the tribunal.
One representative named by employer.
One representative named by employes.
Two unchallenged members of the panels.
Regional Board of Inquiry
To be named by regional chairman when either one or both parties to dispute refuse to submit to adjustment.
Two representatives of employers, selected from panel.
Two representatives of employes, selected from panel.
One representative of either party making complaint.
Employers' Panel
Selected by Secretary of Commerce
Classified by Industries
Employes' Panel
Selected by Secretary of Labor
Classified by Industries and Crafts

SYSTEM FOR SETTLEMENT OF INDUSTRIAL DISPUTES AS PROPOSED BY THE PRESIDENT'S CONFERENCE

ployes, the practical approach to the problem is to devise a method of preventing or retarding conflicts by providing machinery for the adjustment of differences. To be successful, such tribunals must be so organized as to operate promptly as well as impartially.

"The plain fact is that the public has long been uneasy about the power of great employers; it is becoming uneasy about the power of great labor organizations. The community must be assured against domination by either.

"The plan suggested does not propose to do away with the ultimate right to strike, to discharge or to maintain the closed or the open shop."

Immediately following the announcement of the plan, Samuel Gompers, president of the American Federation of Labor, and Frank Morrison, secretary, issued statements to the effect that trade unions could not indorse it.

"The failure of the conference to recognize definitely the organizations of workers, trade unions, as the basis for representation is a fatal omission," said Mr. Gompers. "Certainly the

conference should reconsider this point in order to make possible the confidence and co-operation of wage earners, which can be expressed only through organizations of their own making."

"The declaration against government employes joining the American Federation of Labor would indicate that the commission has been affected by the temporary wave of anti-unionism," said Mr. Morrison.

"The statement offers no hope to lovers of industrial peace who see the necessity of abolishing autocracy in industry and giving employes a direct voice in their working conditions.

"It is no solution to empower the President and a cabinet official to select representatives of the workers to adjust disputes. The workers must have this power themselves."

Voluntary Arbitration Not the Solution, Says Gary

New York, Jan. 5.—In an interview last week, E. H. Gary, chairman of the United States Steel Corp., was asked to comment on the preliminary report of President Wilson's industrial conference, and the plan proposed for settlement of labor disputes. Judge Gary said the labor situation is not as bad as painted by some public speakers and writers, particularly those who are not by experience or otherwise qualified to testify or to express opinions. He said many strikes were instituted during the past year, but the strikes did not represent antagonism between capital and labor. In most, if not all instances, they were precipitated by union labor leaders acting on their own initiative in creating differences and disputes between labor unions and the managers of businesses.

Judge Gary declared that in few, if any, cases has there been any serious trouble between the managers of industries and the employes generally, or any reasonable claims made by majority of employes for higher wages or more favorable living or working conditions which were not promptly or mutually adjusted. In fact, for a long time employes in this country have been receiving larger compensation and have had better working and living conditions than ever before. A large majority of employes in this country, probably not less than 85 per cent are not members of labor unions and are satisfied with their working conditions. If any have good reason for complaint employers, when informed, must and will furnish adequate remedy. Continuing, Judge Gary said:

"I do not wish, at this time, to discuss the merits or demerits of labor unions. The public generally must know that in the past they have, in proportion to their influence, decreased production, added to costs and raised the expense of living. I venture the assertion that if the public is disposed to protect absolutely everyone against imposition on the part of capital or labor it should not depend upon voluntary arbitration but should establish and administer laws which will have complete jurisdiction over both groups of citizens, and then to rely upon the continuance without interruption of the enforcement of law and order, so that every individual or interest shall be protected in freedom of action or nonaction,, so long as there is no opposition to any of the statutes in force. Employers and the body of employes clearly recognize that it is for the pecuniary interest of both to maintain peaceful and friendly relations, and every honestminded person admits this will redound to the benefit and comfort of the general public."

Time Limit Put on Pickets by Federal Judge

Men who remain away from their place of employment seven months may no longer be considered employes, even if they call themselves "strikers," and the strike may no longer be considered in effect, Judge John M. Killits in the United States district court ruled in formally ending the strike at the plant of the Willys-Overland Co., Toledo, O., Dec. 28. The court granted a permanent injunction against the trade unions involved in the strike, requiring them to withdraw their pickets from the plant. No man or woman employed by the company last May, when the strike was inaugurated, who is not now on the company's payroll is entitled to consideration in court as an "employe," the court held. In effect, the trade unions were notified that seven months was ample time for them in which to fight out a strike, and that the company should now be allowed to operate without interference from pickets. The decision is said to establish a precedent in strike cases.

Puddling Rate Advanced 25 Cents a Ton

The rate for puddling iron, which has been based on a 2.50c card for the past four bimonthly periods, moves up 25 cents per ton for 60 days beginning Jan. 1. The bimonthly examination of sales at the office of James H. Nutt, secretary of the Western Bar Iron association, Youngstown, O., Dec. 31, disclosed an average sales price for the past two months of 2.55 cents. The puddling rate, which since the July-August period was $12.38 per ton, is now $12.63. Under the scale in effect prior to July 1, 1919, a 2.55 cent card would have entitled puddlers to $12.30 per ton, but at the annual conference of representatives of the Western Bar Iron association and the Amalgamated Association of Iron, Steel and Tin Workers, at Atlantic City last June, the men were granted a 5 per cent increase over the 1918-19 scale above the 1.30c card. The bimonthly basis of wages for bar iron since Jan. 1, 1917, follows:

	1920	1919	1918	1917
Jan.-Feb.	2.55c	3.10c	3.10c	2.35c
Mch.-Apr.	.....	2.75c	3.30c	2.45c
May-June	.....	2.50c	3.35c	2.65c
July-Aug.	.....	2.50c	3.40c	2.75c
Sept.-Oct.	.....	2.50c	3.45c	2.85c
Nov.-Dec.	.....	2.50c	3.45c	2.95c
Yearly average	.....	2.64c	3.34c	2.65c

Henry Ford Announces Profit-sharing Plan

Detroit, Jan. 3—Henry Ford announced to his 90,000 employes on New Year's eve, that payments aggregating $8,000,000 would be made to them this month in accordance with a profit-sharing plan. This includes an investment plan whereby any employe may purchase Ford Motor stock certificates with a guaranteed rate of interest. The bonuses range from $50, for men paid the minimum wage of $6 a day and who have been in the company's employ since Oct. 1, 1919. to $270 for men receiving $10.80 a day and employed since Oct. 1, 1914. The 53,000 employes of the Ford Motor Co. in Highland Park, Mich., as well as those at the blast furnaces in River Rouge, Mich., the tractor plant in Dearborn, Mich., and assembly plants throughout the country share in the distribution, as do the salaried employes and executives.

Stock is to be sold employes in denominations of $50, $100 and $1000 and must be paid for out of bonuses and wages, none to be permitted to invest more than one-third of his yearly income. The certificates bear 6 per cent interest and additional interest semiannually if warranted by the profits of the company.

Over 4000 employes of the Massey-Harris Co., in its plants at Toronto, Weston, Brantford and Woodstock, Ont., signed an illuminated address, expressive of their appreciation and good wishes, which was presented to Manager Thomas Findley of the company's Toronto plant on Christmas morning.

Here and There in Industry

Live Information Which Records the Expansion of Various Lines of Productive Enterprise

CHATTANOOGA, Tenn., has been definitely selected as the location for the southern branch of the Somerville Iron Works, Somerville, N. J. Work upon the branch, representing an investment of $1,500,000, will be begun immediately. The plant will be located in north Chattanooga on a 35-acre plot just west of the Chattanooga Stamping & Enameling Works. Cast iron soil pipe will be manufactured exclusively. The branch will have a capacity of approximately 50,000 tons of pipe annually. It will be managed by T. G. Bush. Contracts for construction have been let to the Austin Co., Cleveland. The company has agreed to have the building completed within 60 days.

* * *

THE Connecticut Co., Bridgeport, Conn., has recently started a new foundry with F. R. Good as superintendent. The latter formerly was associated with the Belton Machine Tool Co. also of Bridgeport.

* * *

THE Mid-Continent Equipment & Machinery Co. has been organized at St. Louis, to deal in railway supplies, with offices in the Security building. F. W. Glauser is president and J. B. Fidler is secretary-treasurer.

* * *

INSTALLATION of a 1000-pound revolving electric furnace for melting brass and copper alloys for the York Hardware & Brass Works, Inc., will be made by the American Metallurgical Corp., Franklin Trust building, Philadelphia. A contract for this equipment recently was signed.

* * *

A NEW plant for the Sheet Steel Products Co., Bryan, O., being built at Michigan City, Ind., into which the company hopes to move in February, will give greater facilities for the production of steel cabs, seat and dash units, running boards, floor boards and other motor truck and automobile parts.

* * *

DIRECTORS of the International Steel Tube Co., Cleveland, have voted to commence construction of its new tube plant at once. The president reported he had bought the steel for the building and had made arrangements with one of the largest steel companies for delivery in May.

* * *

MODERN machinery and equipment will be purchased in the near future for a new foundry to be built by the Iron Products Corp., La Crosse, Wis. This plant will be 100 x 150 feet. C. R. Pieper is in charge of the work. He is anxious to communicate with manufacturers of foundry equipment.

* * *

FOR the purpose of enlarging its piston ring producing capacity, the D. & M. Auto Parts Co., Richmond, Ind., recently increased its capital. The company formerly was located at Cambridge City, Ind., but moved to its present location Aug. 1. Some new equipment has been installed, and more is being ordered.

* * *

ORDERS for 165 1-man cars, aggregating $700,000 in value, now are on the books of the Osgood-Bradley Car Co., Worcester, Mass., which will keep the plant busy day and night for the next four months. These orders largely are from New England traction companies. Forty will be built for the Connecticut Co.

* * *

WORK is practically completed on the erection of a machine shop for the Seybold Machine Co., Dayton, O., and machine tools and other equipment will be installed shortly. The building is 140 x 242 feet. All machine tools and equipment have been purchased. The building was erected by the Austin Co., Cleveland.

* * *

ENGAGED in the manufacture of pressed steel double disk wheels for automobiles, the Reliance Wheel Co., Youngstown, O., has acquired a 5-acre site near the plant of the General Fireproofing Co. It will commence the erection of a modern plant at an early date, having outgrown its present leased quarters. Officers of the company recently elected are: Joseph M. Crenan, president; T. E. Milliken, vice president; Harold H. Hull, secretary-treasurer. These officers with Lucius B. McKelvey, Charles T. Gaither, J. S. Culp and Dr. S. W. Goldcamp constitute the board of directors.

* * *

ARRANGEMENTS are being made by the Lapointe Machine Tool Co., Hudson, Mass., to open a branch factory in England and it will select a site in the vicinity of London so as to be in close touch with the continental trade market. The company is signing employes to make the trip and assist in getting operations under way.

* * *

IN ORDER to take care of its increased business in electric tool and alloy steels, the Hammond Steel Co., Inc., Syracuse, N. Y., has recently installed and now has in full operation, additional electric furnaces as well as large rolling and finishing mills. An announcement will be made shortly regarding the removal of its Detroit office.

* * *

AN ADDITION, 240 feet long, is being erected at the plant of the Wisconsin Parts Co., Oshkosh, Wis., and expenditures for building, equipment and machinery are expected to total approximately $100,000. Business for 1919 is expected to aggregate in excess of $1,000,000 and prospects for 1920 give promise of doubling that figure.

* * *

ORGANIZED to purchase and operate the graphite mine and mills, owned by Frank C. and George H. Hooper, the Hooper Graphite Co., Whitehall, N. Y., has a capital stock of $250,000. The officers are as follows: President, Frank C. Hooper, Glens Falls, N. Y.; vice president, Roscoe B. Hayes; treasurer, George Hooper, Whitehall, N. Y., and secretary, Frederick B. Richards, Glens Falls. The home office is located at Whitehall. The mine is said by New York state geologist to contain 1,500,000 tons of available high grade ore. The company will continue the manufacture of high grade flake graphite and now has in operation a large concentrating plant, built in 1916. An enlargement of the refining plant at an early date is contemplated, to care for the manufacture of paints, greases and affiliated lines.

Here and There in Industry

Live Information Which Records the Expansion of Various Lines of Productive Enterprise

IN ORDER to provide facilities adequate to handle the increasing export business and to develop its foreign trade to a greater extent than heretofore has been possible, the Westinghouse Air Brake Co. has organized an export department with headquarters in the Westinghouse building, Pittsburgh, in charge of E. A. Craig, as export manager. This department will be represented in the New York office by W. G. Kaylor and in South America by R. M. Oates.

The Westinghouse Air Brake Co. controls the following foreign companies:

The Compagnie des Freins Westinghouse, Sevran, France; the Compagnia Italiana Westinghouse dei Freni, Turin, Italy; the Westinghouse Brake Company of Australasia, Ltd., Concord West, New South Wales, Australia; the Westinghouse Eisenbahn Bremsen Gesellschaft, Hanover, Germany; the Societe Anonyme Westinghouse, Petrograd, Russia, and the Westinghouse Brake Co., Ltd., of London, England, represented in China by Jardine, Matheson & Company, Ltd., Shanghai; in Denmark and Sweden by Frants Alling, Puggaardsgade 4, Copenhagen; in Holland by Vaillant and Sluyterman, Noordeinde 18a, The Hague; in Japan by Sale and Frazar, Ltd., Yaesu Cho, Tokyo; in Norway by "Vulkan," Jernstoberi and mek. Vaerksted, Christiania, and in South Africa by Bellamy and Lambie, 621 Consolidated buildings, Johannesburg.

* * *

THE New Haven Rivet Co., New Haven, Conn., has been reorganized and plans large extensions to its plant. The company has threaders, headers and nut machines on order, and expects to have a greatly increased capacity in operation by the early spring. The company reports orders ahead covering two years.

* * *

INCORPORATED under the laws of Michigan with $40,000 capital, the Hasse-Cline Pattern & Mfg. Co., 110 St. Antoine street, Detroit, has taken over by purchase the Main Pattern Shop, Inc., 25 East Fort street, and the Detroit Pattern Works, 108-110 St. Antoine street, Detroit. Both plants are equipped to handle anything in the pattern line with the exception of stove patterns. Officers of the company are: President, William F. Haase; vice president, R. D. Johnston; treasurer, C. L. Cline; and secretary, B. F. Guertler.

* * *

THE American Car & Foundry Co., Jersey City, N. J., has received a $1,000,000 order for passenger cars for the M. Z. A. railroad, Spain. The question of financing prevented the acceptance of an offer made by Belgium to reconstruct rolling stock on Belgium soil in plants to be built along American lines, President W. E. Woodin announced.

* * *

THE Buckeye Jack Co., Alliance, O., manufacturer of lifting jacks up to 12-ton capacity, has increased its capital to $1,000,000. New officers are: President, O. F. Transue; vice president, Frank Transue; treasurer and general manager, E. C. Bates; factory and sales manager, Clem J. Bates.

* * *

THE Plymouth Stamped Metal Co., Inc., Plymouth, O., recently increased its capital, and is planning to move its plant from its present location to Galion, O., where better shipping facilities are to be had and labor is more plentiful. At present the increase in capital will be utilized for the purchase of raw material and equipment. W. R. England is vice president of the company.

* * *

EARLY in 1920, the Austin Western Road Machinery Co., Chicago, will commence erection of a branch plant in the northeastern section of Columbus, O. The company recently obtained a 5-year lease on the property of the Shields Pattern Works, for an assembling plant and show room. J. W. Harris will have charge of this branch. The Shields property will be remodeled and two stories will be added.

* * *

THE Frasse Steel Works, Hartford, Conn., has been incorporated under the laws of that state with $1,000,000 capital to take over the business of Peter A. Frasse & Co., Hartford, which has been engaged in the manufacture of steel products for 30 years. The plans of the new corporation provide for the erection of an additional mill which will double the capacity of the plant.

* * *

WITH its cover page given over to a Christmas scene printed in four colors from process plates, the December number of *Crane-ing*, house organ of the Cleveland Crane & Engineering Co., Wickliffe, O., makes a very attractive appearance. Editorial contents are of more than usual interest. The theme "The Story of a Man 1923 Years Old Who Is Still Living" conveys an unusual message in an unusual way.

* * *

SPECIALIZING in the production of emery wheel dressers, the Ross Mfg. Co., Cleveland, has found it necessary to move into larger quarters at 3160 West 106th street. The new plant is a model of its kind; much attention has been paid to the lighting and sanitary arrangements. All equipment is modern and of the latest type and production arrangements are such as to permit of a direct travel from the raw material to the finished product.

* * *

KENNETH B. LEWIS who has recently returned from a six months' trip through Europe and England in the interest of the Morgan Construction Co., Worcester, Mass., announces that the company has secured large orders for machinery. The manufacture of several hundred thousand dollars worth of small machinery for France and Belgium will be started at once at the Worcester plant. The larger machinery will be built in Europe from plans drawn in Worcester.

* * *

THE Automotive Products Corp., New York City, which specializes in the exportation of automotive products, has obtained exclusive sales rights in all foreign territories; for the products of the Standard Roller Bearing Co., Philadelphia and the New Jersey Car Spring & Rubber Co., Jersey City, N. J. Special attention will be given to the metric sizes in demand abroad to replace worn-out equipment or that which was destroyed during the war period.

Here and There in Industry

Live Information Which Records the Expansion of Various Lines of Productive Enterprise

THE Fairbanks Co., Chicago, manufacturer of contractors' supplies, has bought practically the entire capital stock of the H. Channon Co., and will enlarge the business to include several new lines. The Channon company started as a ship chandlery, but since the decline of shipping on the lakes, this angle ceased to be important and the company turned to contractors' supplies, tents, and other lines.

A new organization has been formed with H. G. Elfborg, formerly with the Ajax Forge Co., as president, Benjamin Berntsen and C. C. Viehoff, vice presidents, and John H. Hanley secretary.

The Channon company was founded in 1875 and for some time two sons of Capt. Henry Channon were associated with the latter, leaving that connection to engage in business for themselves. Captain Channon, although active, has reached an advanced age and desires to retire.

* * *

EXCLUSIVELY for the construction of oil country boilers, the building now contemplated by the Sistersville Tank & Boiler Works, Sistersville, W. Va., will be 100 x 150 feet and constructed of steel. The company's present shop building will be utilized only for tank work. It now is in the market for punches, rolls, flanging machines, bevel shears, air hoists, numerous pneumatic tools and three 5-ton electric cranes.

* * *

THE E. A. Kinsey Co. of Cincinnati has been appointed agent for the Millholland turret lathes and screw machines manufactured by the Millholland Machine Co., Indianapolis, in the territory embraced by southern Ohio, Kentucky, Tennessee, western West Virginia and the greater part of the state of Indiana. The E. A. Kinsey Co. will carry Millholland turret lathes and screw machines in stock in both its Cincinnati and Indianapolis display rooms.

* * *

MOTION picture machines will be manufactured by the Precision Machine Co., 172-174 Second street, Milwaukee, which was recently organized. The company does not plan to erect a plant as available factory floor space can be obtained in Milwaukee. C. F. Hussey is general manager. The company has a well equipped machine shop, containing precision lathes, drill presses, hobbing machines and milling machines. It is capitalized at $6000.

* * *

CAPITALIZED at $10,000, Kaufman & Co., Inc., 499 Chene street, Detroit, recently has been incorporated, and plans to engage in the manufacture of cutting pliers, watchmakers' pliers, nippers, etc. Just what equipment is needed other than a number of drop hammers the company is not in a position to state at this time. Officers are: President, E. A. Kaufman; vice president, Carl Schneider, and secretary, E. C. Kircherer.

* * *

THE Wilson-Snyder Mfg. Co., Pittsburgh, has taken over the plant of the Braddock Mfg. Co., Braddock, Pa. Two lots one comprising 224 x 387 feet and the other 96 x 110 feet, on which are located several factory buildings, are involved in the transfer, which is understood to have been made at $250,000. The Wilson Snyder company which manufactures pumping machinery, and has a plant at Water and Cross streets, Pittsburgh, plans to operate both plants for the present.

* * *

UNDER the name of the H. R. L. Motor Co., Seattle, the Hendricks Mfg. Co. and Rothweiler & Co., both of that city, have consolidated with a capital stock of $400,000. J. J. Hendricks is president; H. N. Rothweiler, vice president; J. A. Lagoe, general manager, and H. G. Mead, purchasing agent. In addition to its regular lines, the company hopes to manufacture approximately 300 motor trucks during 1920 made up of 100 each of ¾, 1½ and 2-ton models.

* * *

THE site and buildings occupied by the Symington Chicago Corp., Chicago, have been bought by the United States government for $235,000, and will form part of the arsenal system of the government. The land was taken under lease by the government in June, 1918, and construction of a shell plant was undertaken, equipment being installed. It was not ready to produce munitions in quantity when the war ended. It has been used recently as a machinery warehouse and sales depot.

* * *

CAPITALIZED at $50,000, the Howard Tool Works, Eastland, Tex., has been incorporated and has taken over the business owned by D. M. Howard for the manufacture of oil well supplies, machinery repairing, etc. The company has acquired Mr. Howard's plant, which was erected last summer. Officers are: President and general manager, D. M. Howard; vice president, P. S. Wolfe; secretary-treasurer, H. L. Durlin. The principal office of the company is on East Main street, Eastland, Tex.

* * *

THE capitalization of the Detroit Nut Co., Detroit, recently was increased from $50,000 to $150,000, in order to care for the company's expanding business, and to provide for new equipment requirements. It is not the intention of the company to start at once on a very large expansion, but a plant addition will be erected sometime during the first half of this year. At that time the company will be in the market for machine tool equipment, including automatic screw machines and tapping machines.

* * *

EFFECTIVE Jan. 1, all of the sales and contracting business carried on by the General Fire Extinguisher Co., Providence, R. I., was taken over by Grinnell Co., Inc., Providence, R. I., a new company. The change was made because the old name of the company so specifically described the fire protection section of the company's business, that it prevented the assumption on the part of the public that the company was engaged in several closely related lines of business. The related lines which the Grinnell Co. takes over are: Fire protection, power and process piping, steam, hot water and gas heating, drying and the sale of pipe, fittings, valves and supplies.

Men of the Machinery Trade

Personal News of a Business Character Regarding the Men of Affairs of the Industry

P. J. FLAHERTY was elected president of the Johnson Bronze Co., New Castle, Pa., manufacturer of bronze bushings, at a recent meeting of its board of directors. He fills the vacancy created by the death of G. W. Johnson. Election to the office comes as fitting recognition of his efficient service since January, 1909, during which period, Mr. Flaherty virtually has been executive head of the company. When he took charge of the plant of the American Car & Ship Hardware Co., in 1909, its products were steam and electric car fittings. Mr. Flaherty organized the Johnson Bronze Co., discarded the old line of manufactures which were not paying their way, and began to develop the production of automobile parts and bronze bushings. This not only entailed the rebuilding of the plant but the scrapping of old and the purchasing of new equipment and the building up of an efficient organization, all of which was done under Mr. Flaherty's direct supervision. He also is president of the Lawrence County Manufacturers' association and a member of important committees of various associations affiliated with the foundry industry.

Fred J. Brenner, chief clerk for the American Sheet & Tin Plate Co. at Farrell, Pa., has been chosen president of the chamber of commerce of that place.

John A. Priest, for the past four and a half years advertising manager of the Hendee Mfg. Co., Springfield, Mass., has resigned, effective Jan. 1.

L. C. Neff, formerly of the S. A. Potter Tool & Machine Co., has bought the American Tool & Cutter Co., Chicago.

R. B. Jones and E. E. Hart, formerly with the Dale-Brewster Machinery Co., Chicago, have organized the Industrial & Railway Supply Co., 114 North Desplaines street, Chicago.

M. Levey, for several years associated with the Charles Stecher Co., Chicago, has organized the Continental Machine Co., with a plant at 2002 Clybourn avenue, Chicago.

H. H. Keeler, formerly of the Seattle office of the Mahr Mfg. Co., Minneapolis, starting Jan. 1, took up his new duties as representative of the company throughout northern Ohio, with headquarters in Cleveland. He succeeds F. N. Brooker who has severed his connection with the company.

Hugh L. Siegel, formerly general sales manager for the Ford Roofing Products Co., now is with Walter A. Zelnicker Supply Co., St. Louis, as assistant to the president.

A. C. Bartlett has been placed in charge of the Boston office, Kimball building, 18 Tremont street, recently re-opened by the Massachusetts Blower Co., Watertown, Mass.

P. J. FLAHERTY

Henry Pollard, recently returned from army service as major of ordnance, has been appointed manager of inspection for the Electric Refrigerator Machinery Mfg. Co., Chicago.

Emil A. Bartunek, who for the past six years has served Cleveland as county naturalization clerk, resigned on Jan. 1, to become welfare and employment manager of the Vlchek Tool Co., Cleveland.

Charles A. Lations, head of the Lations Mfg. Co., Worcester, Mass., has been elected vice president of the Bridgeport Motor Truck Co., Bridgeport, Conn., a new corporation, and will have charge of the sales distribution in New England territory.

J. R. Matthews has been appointed representative of the Mahr Mfg. Co., Minneapolis, in the state of Michigan, with headquarters at 205 Kresge building, Detroit. He formerly was attached to the New York office of the company.

J. M. Hewitt, who for several years has been advertising manager of the Pittsburgh Steel Co., Pittsburgh, resigned effective Jan. 1, to become identified with the Morse International Agency, 499 Fourth avenue, New York.

A. L. Mercer, assistant director of sales of the war department, and formerly storage and scrap manager in the New York district ordnance office, has resigned to become president of a newly organized tire and rubber company.

William J. Fisher, superintendent of the A. B. Farquhar Co., York, Pa., has been elected president of the Engineering Society of York. Other officers are: Vice president, Jacob Aldinger; secretary, Griffith Amies; treasurer, William Spangler.

Harry A. Sturges, an electrical engineer, for the past two years assistant superintendent of the Crompton & Knowles Loom Works, Worcester, Mass., has resigned to accept a position as superintendent of the Prest-o-Lite Co., Indianapolis.

Henry J. Fuller, vice president of Fairbanks, Morse & Co., New York, engines, has given $25,000 to the endowment fund of the Worcester Polytechnic institute, Worcester, Mass. Mr. Fuller is a graduate of the class of '95, and a son of Dr. Thomas T. Fuller, who was president of the institution for many years.

D. M. Stone, for several years Pittsburgh district sales manager for the Square D Co., Detroit, has been promoted to the position of assistant general manager of sales, with headquarters at Detroit. In his new position Mr. Stone also will be Michigan district sales manager for the company.

Men of the Iron Trade

Personal News of a Business Character Regarding the Men of Affairs of the Industry

J. P. PERO, who for the past 11 years has been general superintendent and sales manager of the Missouri Malleable Iron Co., East St. Louis, Ill., has retired after 50 years' continuous service in the foundry industry. He will continue to devote a portion of his time to interests which he maintains in various foundry and manufacturing industries in St. Louis. Mr. Pero, who was born in Waltham, Mass., Dec. 9, 1856, belongs to a family which has been prominent in the foundry business of New England for three generations. He was educated in the public schools of Waltham and Worcester Mass., leaving the Worcester high school in his junior year to become an apprentice molder. This was in February, 1870, when he was only 13 years old. During the following years, until he was made foreman in 1882, Mr. Pero studied the art of molding, specializing in heavy work. Following his first foremanship, he was identified with the management of some of the leading New England and Mississippi valley foundries. His first 30 years in the industry covered gray iron work, while during the past 20 years he has been identified with malleable plants. In 1887, Mr. Pero conceived the idea of an association of foundrymen having for its purpose the exchange of views on technical and practical problems of foundry work. In December of that year he formed the New England Foundrymen's association, which was the original society devoted to educational work among foundrymen in this country. Mr. Pero long has been active in the work of the American Foundrymen's association. He was president of that body in 1916-17, and has been a director continuously for a number of years.

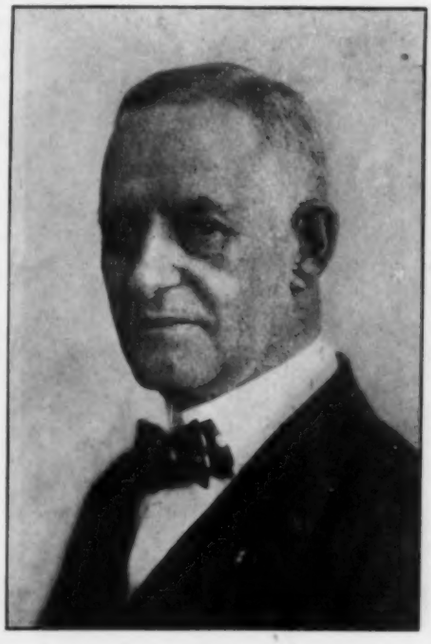
Ray Gheen, formerly secretary to the assistant general superintendent of the Youngstown Sheet & Tube Co., now is associated with the Ohio Steel Products Co., Niles, O.

Alfred A. Corey, president of the Cambria Steel Co., Johnstown, Pa., recently resumed his duties following a brief illness, which confined him to his home.

Charles F. Hutchins, treasurer of the Standard Foundry Co., has been appointed a director of the New Finance Corp., of New England, Boston, which recently was incorporated.

D. M. Howell has become associated with Luria Bros. & Co., Inc., Woolworth building, New York City, dealers in iron and steel, as manager of the Boston office.

John Barnard, formerly construction



J. P. PERO

engineer with the Standard Parts Co., Cleveland, has become associated with the McCann-Harrison Co., Cleveland engineer and constructor, in charge of sales and publicity.

S. W. Harvey, formerly a storekeeper of the Hartford Electric Light Co. Hartford, Conn., has been appointed purchasing agent of the Connecticut Electric Steel Co., Inc., that city.

Alfred Pearson, assistant manager of the Pennsylvania division of the Consolidated Coal Co., has tendered his resignation to accept the position of chief engineer, at the West Virginia coal fields of the Bethlehem Steel Corp.

Harry F. Bookstoce who has been attached to the treasurer's department of the Carnegie Steel Co., Pittsburgh, for the past 15 years has been appointed to the recently created position of assistant to treasurer.

John W. Phillips has been made manager of the tool steel department of the Aborn Steel Co., Inc. Mr. Phillips will be located at the company's main office, 22 Clarke street, New York City.

W. W. Lewis has been appointed superintendent of the Falcon Steel Co., Niles, O. Mr. Lewis formerly was superintendent of the Western Reserve Steel Co., prior to its being absorbed by the Brier Hill Steel Co.

Stephen J. Carroll, vice president of the Pennsylvania Steel Export Co., Philadelphia, just has returned from a four months' trip to South America, having visited Argentina, Brazil, Chile and Peru particularly.

George E. Harris, who formerly was superintendent of the steel department of Peter A. Frasse & Co., Inc., Buffalo, and director of sales of the Hawkridge Bros. Co., Boston, has been appointed sales manager of the Falcon Steel Co., Niles, O.

H. W. Bleakley, who formely was associated with the Remington Arms Co., Hoboken, N. J., is now works manager of the Salvage Arms Co., Sharon, Pa. H. Fish has assumed the superintendency of the pressed-steel department having been transferred from the Savage Arms Co.'s Philadelphia plant.

Louis J. Campbell has resigned as vice president of the Youngstown Sheet & Tube Co., Youngstown, O., to become affiliated in an executive capacity with the new company organized in Youngstown, the Electric Alloy Co., which is to build an electric steel plant to manufacture vanadium, chrome and nickel steel.

A. H. Fosdick, superintendent of the employment and welfare department of the Bethlehem Steel Co., Bethlehem, Pa., has been appointed assistant to George M. Hohl, superintendent of blast furnaces at Bethlehem. George W. Vary has been appointed superintendent of the employment and welfare department, succeeding Mr. Fosdick.

Men of the Iron Trade

Personal News of a Business Character Regarding the Men of Affairs of the Industry

JAMES W. BRAINARD, whose duties carried him into every section of the country where steel hoops are used, and hence gave him an exceptionally wide acquaintance in the steel industry, retired as special sales agent of the Carnegie Steel Co., Dec. 31, to become president of the J. W. Brainard Steel Co., with a plant and general offices at Warren, O. As a boy of 17 years, just after the completion of high school studies, Mr. Brainard went to work in the Sharon, Pa. plant of the old Atlantic Iron & Steel Co., in which his father was interested and of which Peter Kimberly then was president. His first job was in cleaning out the ashes from the pits of the puddling furnaces. At the end of four years, after having had experience in blast furnace and rolling mill work, he was made general manager of the plant, remaining there to see the absorption of the company by the American Steel Hoop Co. and the merging of this company in turn into the United States Steel Corp. He then became attached to the Cleveland sales office of the Carnegie Steel Co., where he remained for a number of years. Subsequently he was transferred to the Pittsburgh office, and was made a special sales agent in charge of sales of hoops and also of the supply of rivets provided by the Carnegie company with its hoops. In addition to his duties with the Carnegie company, Mr. Brainard has conducted in the past few years the Fowler Rivet Co., with a plant at Braddock, Pa., the starting of which was to assure the Carnegie company of a sufficient and constant supply of hoop rivets. Makers of these rivets failed to deliver their contracts in full and the Carnegie company was in difficulty in making complete hoop shipments. Called to New York by President Farrell to explain the difficulty, Mr. Brainard got the latter to agree to allow him to make good the deficiency in his own way. He did this by securing eight rivet-making machines then crated for export to Japan, from an eastern manufacturer and had them consigned to Pittsburgh even before he had secured a plant, in which to set them up. He found this at Braddock, Pa., an unused plant of the American Steel & Wire Co., and from the latter secured the wire stock. This was the origin of the Fowler Rivet Co., which now is part of the J. W. Brainard Steel Co., and with the completion in March of the new plant now under construction at Warren, O., the Braddock works will be moved to Warren. Mr. Brainard is the patentee, among other developments of hoops of the Brainard slack barrel hoop and the Brainard steel heads for slack cooperage. The Carnegie Steel Co. at present is making hoops under seven patents of Mr. Brainard. The slack barrel hoop, in black and galvanized finishes, steel heads for slack cooperage and cooper's rivets will be the principal products of the new company.

M. I. Arms II, formerly treasurer of the Republic Rubber Corp., Youngstown, O., has been elected president and treasurer of the Aetna Foundry & Machine Co., Warren, O. M. C. Boyd has been appointed secretary.

Alphons L. Orschell resigned recostly as brass foundry superintendent of the Lunkenheimer Co., Cincinnati, and now is affiliated with the Hill & Griffith Co., that city, manufacturer of foundry facings, supplies and equipment.

A. K. Kimmel will retire as president of the Youngstown Stove Co., Youngstown, O., Jan. 1, 1920, when the company will become consolidated with the Victor Stove Co., Salem, O., Mr. Kimmel having sold his interests in the Victor company.

Alva C. Dinkey, president of the Midvale Steel & Ordnance Co., will be the principal speaker at the annual banquet of the Engineers' Society of Western Pennsylvania, at the William Penn hotel, Pittsburgh, on Monday evening, Jan. 26.

B. B. Schwartz, who has been connected with the engineering department of C. W. Hunt Co., Inc., West New Brighton, N. Y., for several years, recently was appointed purchasing agent to succeed H. P. Fletcher.

Clyde W. Blakeslee has resigned from the management of the Abrasive Co., at Chicago, effective Jan. 1, and will become sales manager, domestic and foreign, for N. A. Strand & Co., manufacturers of flexible shafts and equipments, at room 201 Machinery hall, Chicago. N. A. Strand & Co. have a plant at 625 West Jackson boulevard, Chicago.

Howard E. Jeffries, who has been connected with the treasurer's department of the Carnegie Steel Co., Pittsburgh, for 33 years, has been appointed assistant treasurer succeeding William R. Conrad, who retires also after a service of 33 years.

Frederick H. Paine, of Boston, has been elected president of the Greenfield Tap & Die Corp., Greenfield, Mass., to succeed Frank O. Wells, who has retired from that position as announced in THE IRON TRADE REVIEW of Dec. 25, 1919.

Wiley H. Marble, formerly of Worcester, Mass., and who recently returned from France where he served as lieutenant with the Sixth Engineers, Third Regular division, has assumed his new duties as manager of the American Stainless Steel Co., Pittsburgh.

J. C. Mackrell Jr., on Jan. 21, will assume his new duties as sales manager of the Electric Welding Co., Pittsburgh. Mr. Mackrell for several years has been with the Witherow Steel Co., Pittsburgh, having been district manager of sales for the company in Ohio and West Virginia.

H. W. McAteer, president of the American Steel Export Co., and its subsidiary, the Automotive Products Corp., Woolworth building, New York City, at present is touring Europe, covering practically all the territories in which those companies are operating.

R. E. Carpenter, manager of the Lynite laboratories of the Aluminum Castings Co., Cleveland, addressed a joint meeting of the Cleveland section of the American Society of Mechanical Engineers and the Cleveland Engineering society Dec. 23, on "The Meaning of Industrial Research."

J. Frater Taylor has retired from the board of directors of the Lake Superior Corp. to become a director of the Canadian Car & Foundry Co., Montreal. He was presented by the directorate of the Lake Superior Corp. with an address expressing their appreciation of his services.

Calculating Corporation Taxes

Method For Determining Normal and Excess Profits Levy For 1919 Follows General Lines Which Applied in 1918, But Results in Considerable Reduction — Specific Examples Presented For Guidance of Taxpayers

INCOME TAX DEPARTMENT
Conducted by
WOLFF, MILLER & CO.
Certified Public Accountants
1326 Broadway, New York City

THE method of calculating corporation taxes for 1919 follows practically the same lines prescribed in 1918 for normal and excess profits taxes. The tax rates, however, for 1919 are considerably less than in 1918. The essential differences in rates follow:

The war profits tax of 80 per cent existing in 1918 is abolished and is not applicable to 1919.

The normal tax rates are reduced from 12 per cent to 10 per cent.

The excess profits tax rates are reduced from 30 per cent to 20 per cent on all profits in excess of exemption and up to 20 per cent of invested capital, and from 65 per cent to 40 per cent on the balance of profits.

Corporations therefore, are subject to two kinds of taxes in 1919: Excess profits taxes, 20 per cent and 40 per cent, and normal taxes, 10 per cent. As regards excess profits taxes, the method of taxation allows a supposed reasonable return on the investment, which return is exempt from taxation, and then taxes heavily any profits in excess of the reasonable return. The law designates as a reasonable return 8 per cent of the invested capital, plus $3000 specific exemption. This reasonable return is known as the excess profits credit, and represents the amount which is non-taxable under this head.

The balance of the net income after deducting the excess profits credit is taxable according to certain percentages and is designated in the law as the first bracket and the second bracket. This results in a 20 per cent tax on income in excess of the excess profits credit but not exceeding 20 per cent of the invested capital, first bracket, and 40 per cent of all net income in excess of the 20 per cent of the invested capital, second bracket. The rates for 1918 were 30 and 65 per cent respectively.

For example, in a case explained further on in this article, the excess profits credit, or reasonable return, would be 8 per cent of $250,000 invested capital, or $20,000, plus $3000 specific exemption, or a total excess profits credit of $23,000, leaving a taxable balance of $77,000. The amount of tax paid on this, in accordance with percentages outlined would be $25,400. As a matter of fact, the term excess profits taxes is a misnomer, as it is evident that under present business conditions 8 per cent of invested capital is not reasonable.

In order to protect the small corporation, a limitation has been placed on excess profits taxes. It is provided that the excess profits tax shall not exceed 20 per cent of the net income in excess of $3000 and no greater than $20,000, plus 40 per cent of the amount of net income in excess of $20,000. This, however, is not intended to increase the tax in any case where under the limitation clause the tax would be higher than under the excess profits method. If the limitation method were applied to the case illustrated below, the results would be as follows:

	Income	Tax
Exempted income	$ 3,000	None
Taxable at 20 per cent	17,00	$ 3,400
Taxable at 40 per cent	80,000	32,000
Total income	$100,000	
Total tax		$35,400

The normal tax levied on corporations is 10 per cent of the net income after deducting from such income the amount of excess profits taxes, plus a specific exemption of $2000. In 1918, the rate was 12 per cent. In the following case, the normal tax is 10 per cent of $72,600, which is the total net income of $100,000, less the excess profits tax of $25,400 and a specific exemption of $2000, and which results in a normal tax of $7260. The entire tax payable by this hypothetical corporation is determined by adding the excess profits tax of $25,400 and the normal tax of $7260, resulting in a total tax of $32,660, which is here approximately 33 per cent of the profits earned for the year 1919.

Basic facts:

Invested capital in 1919	$250,000
Profits for year 1919	100,000

The tax is calculated as follows:

EXCESS PROFITS TAX

Profit for 1919		$100,000
Deduct: Excess profits credit 8 per cent of invested capital of $250,000	$20,000	
Specific exemption	3,000	
Total credit or amount of income exempt		$23,000
Taxable income = $100,000 — $23,000		

$77,000, taxable as follows:

First bracket, amount in excess of credit and not greater than 20 per cent of invested capital is taxable at 20 per cent.

20 per cent of invested capital of $250,000		$50,000
Less excess profits credit	23,000	
Balance, $27,000, taxable at 20 per cent	5,400	
Second bracket, remainder of net income taxable, $50,000 taxable at 40 per cent	20,000	
Total income		$100,000
Excess profits tax		25,400

NORMAL TAXES

Net income for year 1919		$100,000
Deduct: Excess profits taxes as above	$25,400	
Specific exemption	2,000	27,400
Amount of income subject to normal taxes at 10 per cent		$72,600
Amount of normal taxes		7,260

TOTAL TAX

Excess profits tax	$25,400
Normal tax	7,260
Total tax	$32,660

The same corporation in 1918 would have had to pay a tax of $45,288, or 45

THIS article is the second of a new series prepared exclusively for THE IRON TRADE REVIEW *by Wolff, Miller & Co., 306 Broadway, New York on the application of income tax laws and internal revenue regulations to corporations, partnerships and individuals. In this article is described the method of calculating income and excess profits taxes of corporations for 1919. The first article of the series was published in the Nov. 20 issue of* THE IRON TRADE REVIEW *and related to the taxation of individuals. Some of the features of the law as applied to individuals also are applicable to corporations. The articles are prepared by Mark Wolff and David Miller, both certified public accountants of New York state and authors of accounting literature. Subsequent articles will deal with other important features of the tax law, which are matters of vital concern to corporations and partnerships.*

per cent of the net income, instead of the 32 per cent as for 1919. It is evident, using the tax for 1918 as a basis, that there has been a reduction of 29 per cent in tax for 1919 as compared with 1918.

Since the application of this clause results in a higher tax than that shown by the excess profits tax, this limitation clause does not apply here. It is only where the taxes calculated according to this method are lower than the excess profits tax that this tax will apply and be used for the excess profits tax.

In all cases where the period of time is less than a year, the excess profits credit and the normal tax exemption of $2000 will be reduced correspondingly in the same proportion that the time covered bears to a full year.

Some of the important features of this law discussed in our article on individual and partnerships in the Nov. 20 issue of THE IRON TRADE REVIEW also apply to corporations, such as deducting net losses sustained in one year from profits of another year, refund of taxes, revaluation of inventories, deduction for obsolescense, etc. Corporations whose fiscal year ends on a day other than Dec. 31, 1919, will have to compute their tax by applying both 1918 and 1919 rates to the full net income, and then taking that proportion of each calculation of taxes as the number of months falling in each year bears to the full fiscal period. For example, if the fiscal year of a corporation ends on Oct. 31, 1919, the tax will be two-twelfths of the taxes calculated under the 1918 rates and ten-twelfths of the taxes calculated under the 1919 rates. It may happen that actually no profits were earned in 1918. Nevertheless, the method calls for prorating the net profits over the 12 months and including one-sixth of the 1918 tax.

One important point to be remembered is that all corporations must file returns even if there is a net loss. Requests are often received from the internal revenue department for additional information, and where books and records are kept properly and systematically such information is readily obtainable. On the other hand, experience has shown that in a large number of cases books were kept in such a haphazard fashion that a great deal of time and money had to be spent before arriving at the tax.

It is evident that while there has been a considerable reduction in taxes for 1919, yet the amount of taxes payable is still large. This means that the taxpayer must be careful to keep his account in such shape as to enable his taxable income to be determined.

The Wilson-Snyder Mfg. Co., Pittsburgh, has taken over the plant of the Braddock Mfg. Co., Braddock, Pa. Two lots one comprising 224 x 387 feet, and the other 96 x 110 feet, on which are located several factory buildings, are involved in the transfer, which is understood to have been made at $250,000. The Wilson-Snyder company, which manufactures pumping machinery, and has a plant at Water and Cross streets, Pittsburgh, plans to operate both plants for the present.

Reading Iron Takes Over Brooks Nail Works

The Reading Iron Co., Reading, Pa., announces it has acquired the nail works of the E. & G. Brooke Iron Co., Birdsboro, Pa. This adds to the manufacturing equipment of the Reading Iron Co., 16 double puddling furnaces with a 3-high double muck mill, a 24-inch, 3-high double skelp mill with four heating furnaces, and a nail factory of 72 nail machines, the latter long known as one of the landmarks of the eastern Pennsylvania iron industry.

As a result of this acquisition the Reading Iron Co.'s skelp capacity is increased by 2800 tons per month, with a corresponding increase in the production of finished wrought iron pipe. The purchase of the E. & G. Brooke company is the second step in plant expansion which the Reading Iron Co. has made since the present executive management took charge a few months ago. Through the acquisition of the George B. Lessig Co. plant, Pottstown, Pa., last October, the Reading Iron Co. secured an additional muck bar capacity of 2600 tons per month, and became the largest manufacturer of cut nails in the United States.

Missouri Malleable Sold

The purchase of the Missouri Malleable Co., of East St. Louis, by the National Malleable Castings Co., of Cleveland, has been announced, effective Jan. 2. The Missouri company employs about 1000 men and has an annual capacity of about 20,000 tons of malleable products. Its output now is chiefly in specialized railroad and stove parts. Acquisition of the East St. Louis plant gives the National Malleable Castings Co. five malleable iron castings plants, at Cleveland, Chicago, Indianapolis, Toledo and St. Louis. It has also steel castings plants at Sharon, Pa., and Melrose Park, Ill. F. E. Nulsen, retiring president of the Missouri company, is one of the most widely known men in the malleable trade of the country. The business was founded by his father.

Export Sulphate

Is Advanced but Offerings are Small —Production is Improving

New York, Jan. 5.—An advance has been made in export offerings of sulphate of ammonia, the range now being $6 to $6.50, eastern seaboard, for material in double bags. As material is exceedingly scarce, however, there is little business being done at these prices; in fact, producers are sold so far ahead that there is little trading being done for either spot or future delivery. Sellers, generally, are endeavoring to give domestic buyers the preference. The spot market on domestic business continues to be quoted approximately $4 per 100 pounds, f.o.b. producers' plants. The future market is purely nominal.

Coke Oven By-Products

Spot

Per Gallon at Producers' Plants

Pure benzol	$0.27 to .31
Toluol	.28 to .32
Solvent naphtha	.22 to .27

Per Pound at Producers' Plants

Phenol	nominal
Naphthalene, flake	0.07 to .08
Naphthalene, balls	0.08½ to .09½

Per 100 Pounds at Producers' Plants

Sulphate of ammonia	$4.00

Contract

Pure benzol	$0.27 to .31
Toluol	.28 to .32
Solvent naphtha	.22 to .27

Per Pound at Producers' Plants

Phenol	nominal
Naphthalene, flake	0.07 to .08
Naphthalene, balls	0.08½ to .09½

Per 100 Pounds at Producers' Plants

Sulphate of ammonia	nominal

Quotations on other coal tar products are unchanged. Pure benzol is quoted at 27 to 31 cents, and 90 per cent benzol at 23 to 25 cents. Demand for this product remains good, with producers at present unable to meet requirements. However, some improvement is being made in production, and the situation is expected to become considerably easier within the next month or so. Toluol and solvent naphtha are quoted at 28 to 32 cents, and 22 to 27 cents.

The drug trade and dye industry continue to be large buying factors in the naphthalene market and as a result supplies are becoming increasingly scarce. Prices, though, have shown no tendency to advance since two weeks ago, when an advance of a half cent was put into effect in naphthalene flakes. The market on naphthalene flakes may be quoted at 7 to 8 cents, and balls at the old range of 8½ to 9 cents.

Obituaries

HENRY W. HODGE, former public service commissioner of the first district of New York and one of the foremost American engineers in bridge building, died suddenly at his home in New York, Dec. 21, after a 6-weeks' illness of embolism. Mr. Hodge was 54 years old and was born in Washington, D. C. During the war he was attached to General Pershing's staff in France as director of military railroads and bridges with the American Expeditionary forces. Construction of some of the largest buildings in New York City, including the Singer, the Woolworth, the Bankers' Trust and the Cunard buildings, the latter now being erected, were supervised by Mr. Hodge. He designed many of the largest bridges, including the municipal bridge over the Mississippi river, the Great Northern railroad bridge at St. Louis, the Chicago, Rock Island & Pacific bridge at Duluth, all the bridges for the Choctaw, Oklahoma & Gulf railroad, and for the Wabash-Pittsburgh Terminal Co., including the large cantilever bridges over the Monongahela and Ohio rivers. He was engineer for the city of New York in the construction of the Melrose avenue viaduct, the Ninety-sixth street bridge, Blackwell island bridge and Manhattan suspension bridge over the East river. He also was consulting engineer for the Brooklyn Rapid Transit Co., the New Jersey interstate bridge and tunnel commission, and many other corporations.

Frank Rosensteel, 42, a retired iron manufacturer of Johnstown, Pa., was found dead in his apartments in that city Dec. 20, with a bullet wound in his head.

Roscoe Dean Addis, eastern representative of the Foos Gas Engine Co., Springfield, O., died Dec. 18, at his home in Brooklyn, N. Y., of heart disease.

Daniel F. Viles, president of the Waltham Screw Co., Waltham, Mass., died at the home of his son, Edgar Viles, in Concord, Mass., Dec. 24. He was a Civil war veteran.

George D. Mayo, founder of the George D. Mayo Machine Co., Laconia, N. H., in 1903, maker of the Mayo knitting machine, of which he was the inventor, now owned by Scott & Williams, Inc., New York, died in a Boston hospital, Dec. 27, aged 69 years. He disposed of the business in 1911.

Theodore M. Nevius, former president of the board of education of Montclair, N. J., and retired manufacturer of wrought iron, died of apoplexy at his home there, Dec. 23, aged 73.

George T. Phipps, aged 79, head of the Phipps Furnace Co., Milwaukee, died suddenly at his home in that city, Dec. 14, from heart failure. Mr. Phipps located in Milwaukee about 65 years ago, coming from England.

M. C. Sullivan, who represented the M. A. Hanna Co., Cleveland, in Toledo for about 20 years, died Dec. 28, after an illness of several weeks. He also was superintendent of the Ironville Dock & Coal Co.

Thomas Beattie Oliver, for many years secretary and treasurer of the Andrew B. Hendryx Co., New Haven, Conn., maker of wire goods, died Dec. 24, of pneumonia, after a few days' illness, aged 58 years.

Frank P. Rowand, 71, for the past 33 years attached to the treasury department of the Union Switch & Signal Co., Swissvale, Pa., died at the Columbia hospital, Wilkinsburg, Pa., Jan. 1. He was a native of Greenville, S. C.

Daniel Williams, 67, superintendent of the open-hearth furnace of the plant of the N. & G. Taylor Co., Cumberland, Md., died recently. Mr. Williams was a native of Wales but came to this country 28 years ago and had been connected with the N. & G. Taylor Co. for the past 17 years.

William J. Roberts, who started the sheet lead business in Cleveland that later took the name of Gibson & Price, died Dec. 29, at his home in Cleveland. He was 75 years old. Mr. Roberts was vice president of the United Lead Co., which controls the Gibson & Price company.

Sigmund Falk, vice president and director of the Duquesne Reduction Co., and a director of the Keystone Bronze Co., Pittsburgh, died in Baltimore Dec. 17, following an illness of several weeks. He was born in Westmoreland county, Pa., in 1873, but located in Pittsburgh early in life and became a prominent figure in the business life of that city, having been active in the affairs of the Crown Chemical Co., the Falk Co. and the Falk American Potato Flour Co., in addition to those companies previously mentioned.

Herbert A. Streeter, Chicago, president of the Streeter Clip & Specialty Co., died Dec. 22 from heart disease, at the age of 86. He was a pioneer in modern steel construction, introducing the method of fabricating members of steel buildings at the shop instead of cutting them on the job. He was born at Rochester, N. Y., and removed to Chicago in 1869.

Richard Gray Park, 69, conspicuous in the financial and business life of Philadelphia, died at his home at West Chester, Pa., Dec. 20. He was born in Pittsburgh and was the son of James Park. He left Pittsburgh about 40 years ago to take charge of the New York office of Park Bros. & Co., Ltd., subsequently moving to Philadelphia. He was a brother of the late W. G. Park and David E. Park.

Col. Charles Alexander, a director of the Steel Co. of Canada, Ltd., died at his home in Providence, R. I., Dec. 28, aged 72 years. Previous to the organization of the Steel Co. of Canada, Ltd., in 1910, Colonel Alexander was vice president of the Canada Screw Co., Ltd., Hamilton, Ont., one of the constituent concerns of the combination. He also was a director of the American Screw Co., Providence.

Albert Schmid, prominent mechanical and electrical engineer, and associated with the Westinghouse enterprises for almost 35 years, died at the St. Hubert hotel, New York, Dec. 31, following an illness of several months. Born in Switzerland 59 years ago, Mr. Schmid, was invited to this country by the late George Westinghouse in 1885. He entered the employ of the Union Switch & Signal Co., Swissvale, Pa., as a draftsman. Later he took up electrical work, which led up to the foundation of the Westinghouse Electric & Mfg. Co. He became superintendent of electrical work for that company and later was made general superintendent. In the late nineties, Mr. Schmid went abroad to become managing director and chief engineer of the French Westinghouse company and remained there until the outbreak of the war, when he returned and took up his residence in New York.

Tool Sales Maintain High Level

December Activity in Machine Tool, Crane and Equipment Circles Compares Favorably With Previous Months and Similar Periods in Other Years—Automotive and Allied Industries Continue in Lead

DESPITE several deterrents, machine tool and equipment sellers rolled up a sizable sales aggregate for the month of December. These hampering factors included the general labor situation; the approach of inventory-taking time; the period of slackness around the holidays and the exhausted state of 1919 machinery budgets, one or more of which caused many users to postpone purchases until January or February. Some of these, however, had less of an effect last month than in similar periods of former years, since imperative production needs called for the earliest possible installation of equipment in many cases. Hesitancy to buy machinery was noted in several districts because of the fuel situation superinduced by the coal strike, but various expedients were adopted by tool users to keep plants running, including the installation of oil-burning equipment and the operation of electric motors. Expectancy that prices will advance early this year, brought many users to the closing point on issued lists. Sales of hammers were particularly heavy in the western districts as were awards of fabricating equipment in the east. On the whole, December, as a tool-selling month, compares favorably with Decembers of other years and for some sellers, exceeds the busiest months of the feverish wartime activity.

Miscellaneous Manufacturers Buy Heavily

USERS of hammers in the Middle West, forged to the front in December. Sellers of this class of equipment were kept busy answering quotations, which averaged two a day. Makers accordingly, were busy, although they maintained their ability to give favorable deliveries. Some of the larger purchasers of hammers were: The Lakeside Forge Co., Erie, Pa., which took 12; the American Forge & Machine Co., Canton, O., and the Truscon Steel Co., Youngstown, O., which closed on several, as did the Forest City Machine & Forge Co., and the Hydraulic Pressed Steel Co., Cleveland.

Heavy equipment was bought last month for the Toronto, O., plant of the Follansbee Bros. Co., Pittsburgh, and the Bessemer Limestone Co., Youngstown, O., closed on approximately $500,000 worth. The Chain Belt Co., Milwaukee, bought a number of presses. The Worthington Pump & Machinery Corp., New York City, took quotations on approximately $120,000 worth of machines on its 1920 budget.

Brass manufacturers made fair sized purchases early in the month, the American Bronze Co., Philadelphia, and the Oxweld Acetylene Co., Jersey City, N. J., each closed on machine tools. The Standard Oil Co., bought some equipment in the east for its new Toledo, O., refinery. Sizable lists were issued by the Otis Elevator Co., New York; E. J. List Mfg. Co., Havana, Ill.; the Wm. H. Haskell Mfg. Co., Pawtucket, R. I.; the Lycoming Foundry & Machine Co., Williamsport, Pa., and the Van Dorn Iron Works, Cleveland, the latter calling for $100,000 worth.

Automotive Industry Takes Usual Quota

FROM the automotive field came sizable business in December as in previous months. Forge equipment was bought for the Allis-Chalmers Mfg. Co.'s tractor plant at Milwaukee. Additional machine tools were purchased for the Samson Tractor Works, Janesville, Wis. Featured in the East was the list of about 200 tools from the Wright Aeronautical Corp., New Brunswick, N. J., and buying by the Willys Corp., Elizabeth, N. J., which aggregated $600,000, $400,000 of which was for special machinery, being built by an Ohio maker.

Parts companies, however, furnished a large amount of buying, the New Departure Mfg. Co., Bristol, Conn., is said to have taken $1,000,000 worth of equipment. The General Electric Co., placed many orders for its various plants including Rochester, N. Y., and Decatur, Ind., and announced its intention to make the Erie, Pa., works second only to the Schenectady, N. Y., plant. The Columbia Axle Co., Cleveland, bought equipment as did the Adams Axle Co., Findlay, O. The Timken-Detroit Axle Co., Detroit, increased its capital to $45,000,000 and a large expansion program is contemplated for both Detroit and Canton, O., plants. The Torbensen Axle Co., Cleveland, was sold to Willys interests and a new company, the Eaton Axle Co., was formed by Torbensen people to build a $1,000,000 plant.

Shipbuilders and Steel Plants Buy Cranes

SHIPBUILDERS took a large number of cranes in December as did steel plants. The Sun Shipbuilding Co., Chester, Pa., closed on its revised list. The Union Shipbuilding & Dry Dock Co., Baltimore, is understood to have awarded 12 or 14 overhead cranes to the Toledo Bridge & Crane Co., Toledo, O. The New York Shipbuilding Corp., Camden, N. J., bought and the Todd Shipyards, New York City, soon will. So far as could be learned the Bethlehem Steel Co., did not close on 11 overheads for Lebanon, Pa., and four for Sparrows Point, Md. Follansbee Bros. Co., Pittsburgh, issued revised specifications on 22 cranes for its Toronto, O., plant, and the American Sheet & Tin Plate Co., asked for bids on eight for Vandergrift, Pa. The Jones & Laughlin Steel Co., Pittsburgh, purchased a few cranes and the Foote-Burt Machine Co., Cleveland, started to close on its list of 17 small cranes for its new plant. The Westinghouse Electric & Mfg. Co., East Pittsburgh, issued inquiries for 12 cranes for its turbine plant at Essington, Pa., and one for four cranes for its Lester, Pa., plant. The Willys Corp., Elizabeth, N J., asked for quotations on 12 cranes.

Carbuilders and Railroads Are Active

ANTICIPATING the early return of the railroads by the government to private ownership, railroad equipment manufacturers began to look to their equipment needs. Eastern carbuilders were large purchasers of fabricating equipment; the American Car & Foundry Co., began to close on about $200,000 worth of machine tool equipment, for its various plants and the Magor Car Corp., Passaic, N. J., closed on $90,000 worth. The latter company also is in the market for cranes and the former took bids on 12 overheads. The American Locomotive Co., New York City, bought considerable equipment and contemplates additional purchases soon. Action was taken by the Chicago, Burlington & Quincy railroad on its large list of machine tools upon which it has been negotiatnig so long, immediately on receipt of the President's message that the roads would go back to private ownership March 1. The Pennsylvania lines west had closed on miscellaneous tools for Stark, O., as well as on cranes for Crestline, O., earlier in the month. The Delaware, Lackawanna & Western railroad bought cranes at Wickliffe, O.

Year Starts Well for Tool Trade

**Railroad Demand Forges to Front With Nearness of Return to Private Ownership—
American Car & Foundry Takes $120,000 Worth Fabricating Equipment—
Large Crane Orders Booked With Large Number Pending**

PREPARATIONS are being made to entertain voluminous buying on the part of railroads on or shortly after March 1, when they return to private ownership. It is thought in some directions that actual buying may take place before that time since deliveries in some cases cannot be had inside of 60 days and in some, four to six months. While President Wilson's announcement was quickly followed by the closing on its big list by the Chicago, Burlington & Quincy railroad, the Santa Fe has taken no action on its requirements issued some time ago. Dealers' representatives in Cleveland are keeping closely in touch with railroad purchasing agents. Further east, activity by railroads is more marked and in fact is a feature of the demand in New York City and vicinity. In Pittsburgh, the Pennsylvania lines west are particularly active issuing sizable lists for Stark, O., and other shops west. Tentative inquiries by eastern railroads are sufficiently large to indicate the hugeness of the accumulated demand of the past five years.

Many machinery sellers in Chicago and elsewhere have about 60 days' business booked and one Cleveland seller, had taken orders in January for a normal month's business by last Monday noon. Inquiries are plentiful and prices remain strong, with indications of pending advances where they have not been made.

One of the large buyers of plate-working machinery in the east is the American Car & Foundry Co., for Buffalo and Depew, N. Y. It still is in the market for about $80,000 worht for Chicago. The General Electric Co., also bought for Schenectady and Rochester, N. Y., and the Stutz Motor Car Co., purchased some equipment for Indianapolis. Lists are issued by the Brewer-Titchener Corp., Cortland, N. Y., the Sistersville Tank & Boiler Works, Sisterville, W. Va., and the Pittsburgh-Des Moines Steel Co., Des Moines, Iowa. The first calls for 25 steam drop hammers. Prospective purchasers include the Steinmetz Electric Motor Car Corp., Baltimore; Dittmer Gear & Mfg. Co., Lockport, N. Y.; Crescent Insulated Wire Co., Trenton, N. J.; Union Shipbuilding Co., Baltimore, and the Collis Motors, Inc., Huntington, L. I., and several Akron, O., rubber companies.

Chief among the sizable crane awards, noted in Pittsburgh, is that of the Algoma Steel Corp., Sault Ste. Marie, Ont., which also closed for mill equipment. Follansbee Bros. Co., also closed on 17 for Toronto, O., and the Union Shipbuilding Co., Baltimore, bought 14, while the Carnegie Steel Co., awarded two for Duquesne, Pa. The American Car & Foundry Co., bought eight and will purchase five more. The Bethlehem Steel Co. bought four for Sparrows Point and one for Lebanon, while the Carpenter Steel Co., Reading, Pa., closed on two. Many companies closed on one each.

Several cranes are wanted by the American Sheet & Tin Plate Co., for Vandergrift, Pa., and the Westinghouse Electric & Mfg. Co. is expected to close on 12 for its Lester, Pa., turbine plant, shortly. Inquiries for one or two cranes are fairly numerous, with a fair sprinkling of foreign requests.

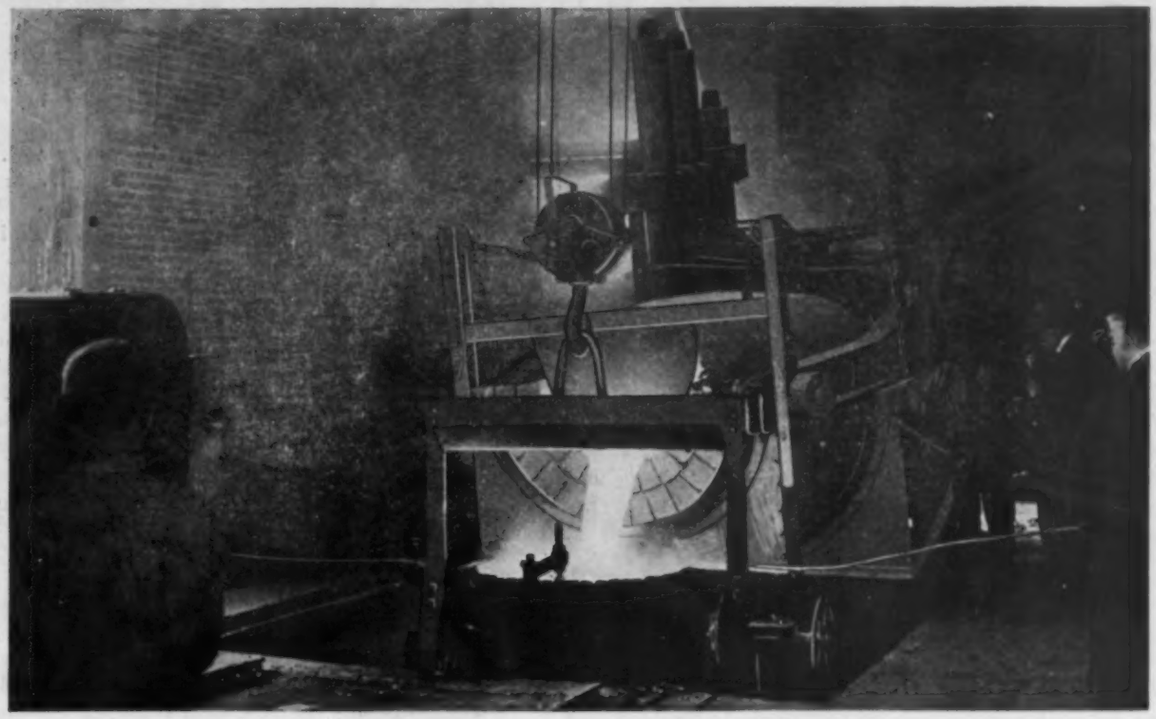
Eastern Railroads Estimating Tool Requirements

EASTERN railroads are obtaining figures at this time for estimating their machine tool requirements. Figures are being asked on a large number of machines which indicates the vast extent to which railroad requirements have accumulated during the past four to five years. How much of this equipment will be purchased is problematical, but it is considered likely that little action will be taken for at least two months or until the time arrives when the railroads will again be returned to private hands.

An outstanding buyer of the past week has been the American Car & Foundry Co., which has closed on considerable plate working machinery for its plants at Buffalo and Depew, N. Y. Of approximately $200,000 worth of equipment to be purchased, about 60 per cent has been booked. The bulk of the remaining equipment to be bought is for Chicago, and includes approximately 15 fabricating machines. Other individual buying for domestic account has not been large, although sellers report an excellent volume of small, miscellaneous orders, the holiday season having had little effect upon trading. Among smaller buyers of the past few days has been the General Electric Co., which closed on a boring mill, two grinders and in all, about eight or nine machines for Schenectady, N. Y. This company has also bought a few tools for Rochester, N. Y.

A strong upward tendency is noted in prices, and several advances have been reported. One eastern builder of machine tools has advanced on his various products, the minimum being about 10 per cent. A builder of turret lathes recently increased his price 7½ per cent.

Considerable forge shop equipment is to be purchased by the Brewer-Titchener Corp., Cortland, N. Y. Included are 25 3000-pound drop hammers. Recently $500,000 was appropriated by the company for increased facilities, including a stamping plant at Binghamton, N. Y. The



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This is the chief reason why Ludlum Steels are *consistently uniform.*

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new additions are to be in operation by July 1. Of interest to the eastern machine tool trade is the formation of the Steinmetz Electric Motor Car Corp., with a capital of $12,000,000. Charles Steinmetz, chief engineer of the General Electric Co. of New York, heads the new organization, which will build a plant in Baltimore for the manufacture of electrically driven motor cars.

A fair demand continues to come from the Orient and South America. One seller reports the receipt of two orders, totaling 36 miscellaneous machines for shipment to Japan. This seller also reports the sale of several machine tools for export to Brazil. Demand from European countries continues to lag.

Among prospective buyers at this time is the Dittmer Gear & Mfg. Corp., Lockport, N. Y., which is erecting additions for the manufacture of transmissions for automobiles. The Crescent Insulated Wire Co., Trenton, N. J., will likely be in the market within the near future for equipment for a new plant addition. The Union Shipbuilding Co., Baltimore, has issued an inquiry for several fabricating machines. The Wright Aeronautical Corp., located temporarily at New Brunswick, N. J., and which recently issued an inquiry for approximately 200 machine tools, has purchased property in Newark, N. J., for its proposed plant. The company, according to a statement attributed to its vice president, will build Hispano-Suiza motors and in addition will conduct considerable experimental work for the army and navy.

The Bethlehem Steel Co. has awarded four overhead cranes for Sparrows Point to the Morgan Engineering Co., Alliance, O. The order called for one 20-ton crane with 96-foot span, one 10-ton crane with 39-foot span, and two 15-ton cranes with 62-foot and 16-foot spans, respectively. The Bethlehem company also placed with an unnamed builder a 5-ton overhead crane for Lebanon, Pa. It will buy 11 additional overhead cranes for Lebanon, although action will not be taken at this time.

Action was taken by the American Car & Foundry Co., placing eight cranes with the Shepard Electric Crane & Hoist Co., Montour Falls, N. Y.; two 5-ton and three 10-ton for New York City, and three 10-ton for Buffalo. Several are to be purchased within two weeks for Chicago, including three 10-ton overhead cranes with 50-foot span, one 10-ton with 90-foot span and two 5-ton cranes with 50-foot span.

Additional awards include a 15-ton electric crane, with 64-foot span to the Champion Engineering Co., Kenton, O., for the Monahan Stone Co., Newark, N. J. This builder also has received a contract from Westinghouse Church Kerr & Co., 37 Wall street, New York City, for a 10-ton high speed bucket-operating crane, with 100-foot span, and a 5-ton crane with 60-foot span, to also handle a bucket. The cranes are for the Armour fertilizer plant at Chrome, N. J. The Westinghouse Church Kerr interests will take action shortly on either two or three 10-ton high speed bucket-handling cranes for the Armour fertilizer plant at Baltimore. The United Shoe Machinery Corp., Beverly, Mass., is expected to close very shortly on one 5-ton and two 3-ton electric cranes with 28-foot span.

New inquiries include one 5-ton and one 7½-ton electric crane with 82-foot, 4-inch span, and 82-foot, 8-inch span, respectively, from the Chester Shipbuilding Co., Chester, Pa. The American Smelting & Refining Co., 120 Broadway, New York, is in the market for a 15-ton overhead crane with 36-foot span for Chihuahua, Mexico. The Rolls-Royce Co., Ltd., Springfield, Mass., is inquiring for hoisting equipment. No special type is specified. The Tacony Steel Co., Tacony, Pa., is inquiring for one 5-ton electric crane, with 80-foot span. The Pennsylvania Cement Co., Nazareth, Pa., is expected to close this week on two 3-yard bucket cranes, with 90-foot span and 25-foot lift.

Railroads Issue Inquiries in Pittsburgh

MUCH activity marked the ending of 1919 and the beginning of 1920 in the Pittsburgh equipment market. Tool demand is featured by the appearance of what appear to be bona fide inquiries from the railroads. The

Machinery Exports to France Increase October's Total

CONTRARY to expectations, exports of machinery in October were greater than in September, by $1,208,084, according to the data issued by the department of commerce. This was true despite the longshoremen's strike, which held up many vessels in port, and the continuance of low rate of exchange. Exports to France made up $971,374 of this increase, the comparative imports of machinery by that country for the two months for September and October being $1,095,418 and $2,066,792 respectively. With the latter figure, France keeps the lead over all other countries, which she regained in September. England remains second with $941,856 and Canada with $484,123 worth, takes third place from Japan, which has dropped to eighth place with $139,387. Fourth place is occupied by Belgium, fifth by Italy, sixth by Denmark and seventh by South America. Of the total, $308,261 in October for unclassified countries, $102,353 worth of machinery went to Australia and $49,583 went to Scotland. Those countries took $30,467 and $23,238 worth respectively, in September. A comparative table follows:

	Lathes		Other Machine Tools		Sharpening and Grinding Machinery		All other Metalworking Machinery		Total	
	October	September	October	September	October	September	October	September	October	September
France	$263,383	$167,401	$200,487	$222,282	$106,416	$ 83,405	$1,496,506	$ 622,330	$2,066,792	$1,095,418
England	167,868	171,465	236,221	252,889	80,272	80,003	457,495	267,181	941,856	771,538
Italy	17,549	155	45,943	1,474	16,806	793	117,305	44,886	197,603	47,308
Belgium	68,215	107,089	6,666	24,690	45,238	31,243	146,565	195,234	266,684	358,256
Japan	26,191	37,155	21,248	41,459	17,329	31,297	74,619	271,127	139,387	381,038
South America	37,375	41,124	26,431	14,406	1,991	3,808	76,022	74,681	141,819	134,019
Canada	30,893	50,510	149,003	86,493	122,795	31,312	181,432	207,425	484,123	375,740
China	8,752	32,272	2,107	10,390	574	5,800	13,085	25,216	24,518	73,678
Netherlands	2,035	12,197	4,049	6,129	1,334	731	9,116	43,170	16,534	62,227
Norway	7,144	833	16,853	7,644	3,123	64	14,773	2,444	41,893	10,985
Sweden	14,948	15,119	14,842	2,346	23,421	21,646	21,558	30,617	74,769	69,728
Denmark	1,034	7,355	3,760	3,573	620	2,124	29,452	20,564	34,866	33,616
Spain	31,204	18,751	29,241	20,342	25,084	4,579	86,538	44,969	172,067	88,641
Cuba	35,173	19,518	42,306	41,817	2,208	1,810	21,151	13,558	100,838	76,703
British India	6,969	3,576	2,895	1,462	7,521	3,171	8,871	11,487	26,256	19,696
Russia in Asia	18,981	0	15,148	50	400	249	6,791	15,351	41,320	15,650
Total	$737,714	$684,520	$817,200	$737,446	$455,132	$302,085	$2,761,279	$1,890,240	$4,771,325	$3,614,241
All other countries	47,250	40,440	110,681	104,510	13,831	11,546	136,499	100,765	308,261	257,261
Grand total	$784,964	$724,960	$927,881	$841,956	$468,963	$313,581	$2,897,778	$1,991,005	$5,079,586	$3,871,502

FARRELL-CHEEK STEEL CASTINGS

What did your defective castings cost you last year?

Would it not be to your interest to have the satisfaction of feeling practically certain that when you have taken your last cut that the casting is going to be as solid and perfect as when you took your first cut.

Such are the castings made by this foundry where quality is a specialty.

Let us have your blue prints.

FARRELL-CHEEK STEEL FOUNDRY CO.

"Makers of Steel Castings that are a little better than the next best."

Sandusky Ohio

F. C.

STAFF

Say you saw it in THE IRON TRADE REVIEW

Pennsylvania railroad, lines west, again has appeared in the market with a list of tools for the new shops at Stark, O., and other shops. These cover milling machines, radial drills, bolt cutters, boring machines, punches and shears and forging presses. The fact that the railroads go back to private management March 1, encourages expectation that such inquiries, unlike those put out last year, will materialize into substantial orders.

Sixty days now is the best delivery that can be made by any of the tool builders, even on small lines.

Several crane awards recently have been made. The most important of these were 16 cranes for the new structural and rail plant of the Algoma Steel Corp., Sault Ste Marie, Ont., with the Morgan Engineering Co., Alliance, O., which also was awarded the structural and rail mills for this plant; 14 standard and three special type cranes for the new plant of the Follansbee Bros. Co., at Toronto, O., placed with the Alliance Machine Co., Alliance, O., and the 14 cranes for the Union Shipbuilding Co., Baltimore, which went to the Toledo Bridge & Crane Co., Toledo, O. Mill and crane motors for the new Algoma Steel Corp. plant were awarded to the Canadian Westinghouse Co., while the Mesta Machine Co., Pittsburgh, was the successful bidder for the blooming mill for that plant.

The Westinghouse Electric & Mfg. Co. is expected to close shortly on the 12 cranes for its new turbine plant at Lester, Pa. The American Sheet & Tin Plate Co., will require several cranes for its Vandergrift, Pa. plant. The Carnegie Steel Co. has closed with the Morgan Engineering Co. for two cranes for its Duquesne works; the Westinghouse Electric & Mfg. Co. with Edward Harrington Son & Co., Philadelphia, for a small crane and with the Alliance Machine Co. for a special 3-ton crane, both for the East Pittsburgh plant; the Brownell Co., Dayton, O., for two 2-ton cranes with the Euclid Crane & Hoist Co., Euclid, O.; the Sims Co., Erie, Pa. for a 5-ton crane with the Erie Steel Construction Co., Erie, Pa.; the Pressed Steel Car Co. for two Shaw overhead riveter cranes; the United States Sanitary Mfg. Co., Monaca, Pa., for a crane with the Pittsburgh Crane & Equipment Co., Pittsburgh, and the Pennsylvania railroad, lines west, for a 15-ton crane for its Stark, O. shops, with the Whiting Foundry Equipment Co., Harvey, Ill.

Cleveland Sellers Off to Flying Start

OFF to a flying start, sellers of machinery and machine tools in Cleveland and vicinity, anticipate that some records made in 1919 are destined to be broken early in 1920. In the absence of any particularly large lists, buying of small lots and single tools, represents a sizable aggregate and a number of projects are coming to the front which presage large needs for early closing.

Inquiries are plentiful; one dealer expressing himself as being "snowed under." The inquiries received by him call for a lathe here, two milling machines there, a grinder in a third place and some automatics in a another. Such scattered business, however, is indicative of a healthy state of industry and is attractive to sellers. The Cleveland office of one of the large sellers of equipment, reports that a normal month's business has been booked already this month. Similarly favorable reports are contributed by various other sellers both in Cleveland and in Detroit.

In the latter district, activity by the General Motors Corp., continues to interest sellers of machine tools, etc. Extensive purchases are being made for Saginaw, Mich., and other plants. The Dort Motor Car Co. has broken ground for a new motor plant in Flint, Mich. The Homer Furnace Co., formerly the Stowkell Furnace Co., Coldwater, Mich., will be incorporated at $100,000 to operate an iron jobbing foundry and it is understood some equipment will be purchased. Cold weather has curtailed some of the building operations being conducted by automotive companies, chiefly the Wills-Lee Auto Co., Marysville, Mich., and the Cadillac Motor Car Co., Detroit. These two companies are expected to issue formal lists soon.

One of the interesting lists current in Cleveland is issued by the Sistersville Tank & Boiler Works, Sistersville, W. Va. It calls for punches, rolls, flanging machines, bevel shears, air hoists, numerous small pneumatic tools and three 5-ton electric cranes. This equipment is wanted for the company's new addition which will be used for the construction of oil country boilers. The Pittsburgh-Des Moines Steel Co., formerly the Des Moines Bridge & Iron Co., Des Moines, Iowa, will soon be in the market for modern machine tool and traveling crane equipment for its new shop building. The improvement when completed will cost $100,000. Equipment will be purchased in the near future likewise, by the Federal Radiator Co., Zanesville, O., to manufacture complete apparatus for hot water and steam heating. One purchaser of a fair amount of machinery recently is the H. C. Stutz Motor Car Co., Indianapolis.

Salesmen from Cleveland houses are keeping closely in touch with the Akron, O. companies which postponed their purchases and expect to close on some of them this week. This refers to the B. F. Goodrich Co., the Goodyear Tire & Rubber Co., the Firestone Tire & Rubber Co., and the Firestone Steel Products Co.

Interest centers largely in the offices of railroad purchasing agents. It is believed generally that when the railroads are returned on March 1 to private ownership a flood of buying will be unloosed which long has been dammed up. Since deliveries are so poor, however, sellers believe some purchasing agents will now commence to cast around for their requirements.

Presses, etc., will probably be purchased by the Paramount Metal Spinning & Stamping Co., Cleveland, incorporated recently with $50,000 capital by Bernard Holz, S. A. Thorman and others, Society for Savings building. It is thought that the Savage Arms Corp., Sharon, Pa., will shortly replace about $10,000 worth of machinery and tools damaged in a recent fire. The Milburn Wagon Co., Toledo, O., also had a fire recently. The Steel Products Co., Elyria, O., doubtless will have to buy equipment to carry out its plan to build a plant for the manufacture of automobile frames. The Cleveland Twist Drill Co., Cleveland, has purchased a 17-acre site on which it will erect a plant. Contracts have been awarded for a large addition to the plant of the Houghton Elevator & Machine Co., Toledo, O., and next in line will be equipment purchases. Extensive plant additions are planned by the Fast Feed Drill & Tool Corp., Toledo, which if consummated will bring out a list of machinery requirements.

Start Year With 60-Day Backlog

IN SPITE of the slackening of direct interest in machine tool buying Chicago dealers find plenty to do. The principle check to business seems to be less speed in closing on inquiries, many of which probably will not be placed until later in January.

The action of the Chicago, Burlington & Quincy railroad in buying on its long-deferred inquiry is the only sign of activity among railroads. A small list issued a few weeks ago by the Santa Fe railroad has not resulted in orders being placed. Business from several railroad shops is expected to

Kreodone EVERLASTING WOOD BLOCK FLOORS

Peerless in Use for Peerless

THE Peerless Motor Car Company of Cleveland has found our wood block floors to be so satisfactory that several successive calls for additional installations have materialized since the first order.

Where other floors have disintegrated under the insidious action of oil and gas, our floors have mastered the trouble—the big outstanding characteristic of every floor we have installed during the last 20 years and over. All are "going strong" today because they are properly prepared to master every contributory cause of disintegration.

Only selected long-leaf yellow pine blocks treated with our own special pure creosote oil (no tar or other adulterants) are used, which makes clear the wonderful resisting power against decay and the economical, longer-than-ordinary wear which is part and parcel of each smudge-less KREODONE Block.

KREODONE Blocks will not warp, pit, bleed, or split. They stay put—at a lower maintenance cost than any other floor material. If you are looking for pure economy and 100% service—specify KREODONE.

Let us send you our specifications for any floor space you wish to cover. Send us the figures.

Republic Creosoting Company, Indianapolis, Indiana

Plants: Indianapolis Minneapolis Mobile Seattle Norfolk

BRANCH OFFICES:

315 Peoples Gas Bldg., Chicago
206 Erie County Bank Bldg., Buffalo
152 Bay Street, Toronto, Canada
Berkley Ward, Norfolk
222 Society for Savings Bldg., Cleveland
31 Transportation Bldg., Philadelphia
828 Plymouth Bldg., Minneapolis
445 Central Bldg., Seattle
Masonic Temple, Mobile
211 Hammond Bldg., Detroit

We made the first Wood Block Floor in America

Get the Genuine KREODONE Blocks. Watch that spelling—it means service

Peerless Motor Car Co., Cleveland, Ohio
We have several repeat orders for this plant.

develop soon in view of the early return of roads to their owners.

Many dealers find they have 60 days or more of unfilled business on their books thus starting the year with a fine backlog. Indications are present for large business during 1920 and new records are expected to be made.

Some Canadian Dealers Offer December, 1920, Delivery

CANADIAN machinery and machine tool dealers and business men generally state that the demand for their products for the year 1919 was as good and in some respects better than during the five years of the war. Many Canadian sellers closed their books for the year with large and numerous orders for equipment for delivery as far distant as December, 1920. Higher prices are expected at an early date.

Many municipalities were forced to curtail expenditure and hold up public improvements during the war, but with the reconstruction period well under way, these works at Sarnia, Winnipeg and elsewhere, are about ready to go ahead. Specifications for Winnipeg's requirements can be obtained at the office of the City Light & Power Department, 54 King street, that city. The Preston Woodworking Machinery Co., Preston, Ont., is anxious to secure a used 36-inch boring mill or its equivalent. The plant of the Motor Trucks, Ltd., Brantford, Ont., is purchasing equipment for the manufacture of washing machines, etc. The Robb Engineering Works, Amherst, N. S., is ordering new machinery for its plant to manufacture farm tractors.

Construction and Equipment

Concise and Timely Business Building Opportunities from the Field of Industry

Among New England Plants

AUBURN, ME.—The Auburn Sheet Metal Co., Inc., has been incorporated with $10,000 capital by Carl E. Riechert and E. F. Fiechard.

BATH, ME.—The Brousseau Rotary Plunger Pump, Inc., recently was incorporated with $100,000 capital.

SANFORD, ME.—The American Steel Ladder Co. has leased a plant here.

SKOWHEGAN, ME.—The Skowhegan Brass Foundry recently started operations after being idle for some time.

MANCHESTER, N. H.—The Amoskeag Mfg. Co. will build a power house costing approximately $500,000.

BOSTON.—The Simplicity Valve Co. has been incorporated with $200,000 capital by Charles J. Reynolds, Melrose, Mass., Stanley L. Beade, Cambridge, Mass., and Charles E. Conant, Newtonville, Mass.

BOSTON.—Turin Motors, Inc., has been incorporated to make all kinds of motors with $50,000 capital by Lorenzo Avassino, Somerville, Mass.; Frank Zoracco, Dorchester, Mass.; Wilmer J. Tenney, Arlington, Mass.; and Norman P. Merrill, Melrose, Mass.

BOSTON.—The Walter H. Moreton Corp. has been incorporated to build boats, machines and motors with $100,000 capital by Chauncey W. Hood, Maurice H. Brotherton, Walter H. Moreton, Quincy, Mass.; Chester T. Marshall, West Somerville, Mass., and James A. Moreton, Allston, Mass.

EAST SPRINGFIELD, MASS.—Plans are being drawn for a 1-story plant for the Storms Drop Forging Co.

EVERETT, MASS.—The Beacon Oil Co. will erect six buildings, including four 1-story factories, a 2-story factory and a 2-story office and laboratory building, at a cost of $68,000.

GLOUCESTER, MASS.—The General Electric Co. has taken over the 3-story building of Joseph Rowe, and will use it to coil the wires on generators and motors, and will use the seven acres recently acquired for a forging plant.

HOLYOKE, MASS.—The Century Machine Co. has been incorporated for $600,000 and financed by Holyoke, Springfield and Boston capital, for the manufacture of a new type of dish washing machine.

HOPKINTON, MASS.—The Stewart Body Co. has been organized with a capital of $10,000. James D. Stewart is president and Ray H. Stratton, treasurer.

MEDFORD, MASS.—The American Radio & Research Corp. has let the contract for a 2-story, 60 x 140-foot and a 1-story, 60 x 120-foot plant to cost $80,000.

NEWBURYPORT, MASS.—The Metal Products Co. of Newburyport has been incorporated with $10,000 capital by L. M. Grant, Norman Russell and Peter I. Lawton.

NORTON, MASS.—The Norton Silver Co. has been incorporated to make novelties with $50,000 capital by Alfred B. White, Andrew Lowden and Allan H. Bell.

PITTSFIELD, MASS.—Plans are being drawn for a 1-stroy, 100 x 400-foot enameling building for the General Electric Co. in Morningside.

SPRINGFIELD, MASS.—The Wason Mfg. Co. will engage in the manufacture of automobile bodies according to a recent statement.

WORCESTER, MASS.—The Livingston Motor Co. has let the contract for a 3-story and basement, 80 x 250-foot assembling plant.

WORCESTER, MASS.—The Vulcan Foundry Co. has been incorporated with $10,000 capital by R. Nelson Molt, Millbury, Mass., Samuel Seder and Samuel G. Nash.

WORCESTER, MASS.—The New England Brass Foundry Co. has been incorporated as a subsidiary of the Coppus Engineering & Equipment Co., with $150,000 capital by F. H. C. Coppus, Otto Wechberg and Linwood M. Erskine.

AUBURN, R. I.—The Universal Winding Co. has started work on two additions to its foundry. Complete modern equipment will be installed.

PROVIDENCE, R. I.—The G. H. P. Mfg. Co. has been incorporated for $50,000 to manufacture and deal in machinery.

NASONVILLE, R. I.—The Mohegan Mills will erect a 3-story, 30 x 50-foot boiler house.

PROVIDENCE, R. I.—The G. H. P. Mfg. Co. has been incorporated to build machinery with $50,000 capital by Charles A. Proulx, Woonsocket, R. I.; Raymond K. Higgins and Albert E. Graham.

WESTERLY, R. I.—The Westerly Brass Co. recently was incorporated and plans a brass foundry.

BRIDGEPORT, CONN.—The Metropolitan Body Co. has let a contract for a 1-story, 56 x 93-foot plant.

BRIDGEPORT, CONN.—Bennett & Seeley, Inc., has been incorporated to deal in mill and foundry supplies with $50,000 capital, by F. A. Bennett, E. E. Seeley, New Haven, Conn., and F. E. Morgan.

HARTFORD, CONN.—The Hartford Special Machine Co. has started work on an addition.

HARTFORD, CONN.—The American Wiremold Co. has ben incorporated to make moldings with $200,000 capital, by D. Hayes Murphy, G. M. Stewart and John J. Burke, East Hartford, Conn.

North Atlantic States

ALBANY, N. Y.—The Barnet Burstein Auto Body Co. has had plans drawn for a plant addition.

BROOKLYN, N. Y.—The Hemco Electric Co. has had plans drawn for alterations to its plant to cost $12,000.

BROOKLYN, N. Y.—The Kent Machine Works, Inc., recently was incorporated with $100,000 capital, by T. Forster, G. R. and J. W. Kent, 68½ Columbia Heights, Brooklyn, N. Y.

BUFFALO.—The Club Auto Parts & Machine Co. has been incorporated with $30,000 capital, by C. and K. Ulrich and C. F. Lindner.

BUFFALO.—The Davis-Newland & Wilson, Inc., has been incorporated with $15,000 capital to manufacture

CLARK TRUCTRACTOR

THE Gasoline Industrial Truck

CLARK TRUCTRACTOR Co. CHICAGO U.S.A.

A Gasoline Industrial Truck Which Speeds Production

The Clark Tructractor is gasoline driven and designed especially for industrial service.

It replaces hand trucks, wheelbarrows, and other forms of plant haulage—does the same work quicker and at a lower cost.

The Clark Tructractor is but 42 inches wide—narrow enough to pass through most aisles and doorways. Its variable speed (¼ to 12 miles per hour) and easy control enables the Tructractor to turn sharp corners and enter tight places.

The Clark Tructractor has a carrying capacity of 2,500 pounds and ample power to pull heavily loaded trailers at the same time.

The Clark Tructractor cuts handling costs, increases production, saves man power in factory and foundry.

Write for booklet explaining in detail the various tasks performed by the Clark Tructractor

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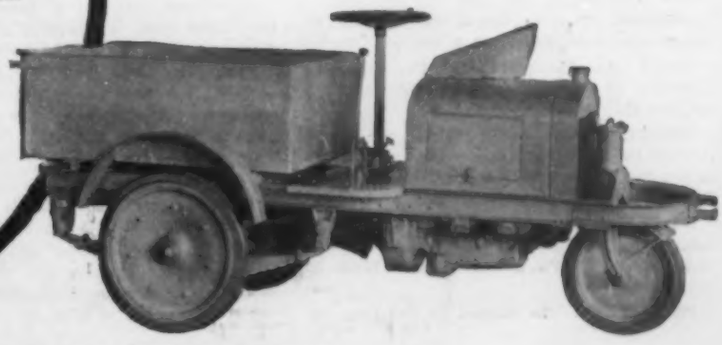
The Gasoline Factory Freighter



motors and engines, by J. A. Wilson, G. W. Davis and F. D. Newland.

BUFFALO.—The Donner Steel Co. will build pickling plant.

ERIE COUNTY, N. Y.—The Holland-Sardinia Light & Power Corp. has been incorporated with $150,000 capital, by M. L. Harrington, J. G. Allen and R. Phillips, Sardinia, N. Y.

HUNTINGTON, L. I., N. Y.—Approximately $100,000 will be expended by the Collins Motors, Inc., for an assembling plant, 80 x 340 feet.

LOCKPORT, N. Y.—The Covert Gear Co., Inc., plans a plant addition, to cost $200,000.

MEDINA, N. Y.—The Medina Stamping & Machine Co. recently was incorporated with $75,000 capital to manufacture castings in all metals, etc., by H. W. Robbins, T. B. Robbins and M. J. Collis.

NEW YORK.—The Braedner Tire Co. contemplates a power plant.

NEW YORK.—The Regina Metal Specialty Co. recently was incorporated with $25,000 capital, by L. E. Schlechter and A. Parker, 200 Fifth avenue.

NEW YORK.—The Domestic Steel & Metal Corp. has been incorporated with $25,000 capital, by H. L. Ettinger, M. Antine and H. Bloom, 149 Broadway.

NEW YORK.—The Shocket Cutlery Products Co. has been incorporated with $20,000 capital, by V. Manheimer, M. A. Arenau and A. Shocker, 1601 University place.

NEW YORK.—A $90,000 plant will be erected for the Vitreous Enameling & Stamping Co., 11 East Sixty-seventh street. The building will be 1-story, 70 x 170 feet.

NEW YORK.—The Auto Metal Products Co. recently was incorporated with $25,000 active capital, by M. M. Henschel, A. C. Berard and J. Deloca, 403 East 152nd street.

NEW YORK.—The United Smelting & Refining Works, Inc., has been incorporated with $50,000 capital, by M. Sack, I. Forman and D. Blenstock, 72 Gerry street, Brooklyn, N. Y.

NEW YORK.—The Reflector Mfg. Co. recently was incorporated to manufacture auto reflectors and dental specialties, with $6000 capital, by M. Rubenstein, R. Kestenbaum and D. Handler, 45 Second avenue.

NEW YORK.—The Blackwell-Davidson Alloy Corp. has been incorporated with $250,000 capital, to manufacture tools, hardware, machinery, etc., by G. Norris, R. J. Mackey and F. H. Ely, 115 Broadway, New York.

NIAGARA FALLS, N. Y.—The By-Products Steel Corp. has been incorporated with $250,000 active capital, by B. Robillard, R. A. Knowles and C. R. Runnels.

RICHMOND HILL, N. Y.—A. H. Grebe & Co. has been incorporated to make wireless instruments, with $50,000 capital, by D. Rigny, L. G. Pacent and A. H. Grebe.

SYRACUSE, N. Y.—The Smith Wheel Co., Inc., 101 North Geddes street, contemplates a plant addition at an estimated cost of $35,000.

SYRACUSE, N. Y.—The Nutlock Corp. has been incorporated with $50,000 capital to make devices, by E. A. Robinson, W. M. Lawyer and A. C. Coon.

TUCKAHOE, N. Y.—The Midland Woodworking Co. recently was incorporated with $30,000 capital, by M. E. Sullivan, S. Kingston and J. J. Loskin, Mt. Vernon, N. Y.

AMBRIDGE, PA.—The Central Tube Co. has let the contract for an addition 40 x 300 feet.

APOLLO, PA.—The Apollo Steel Co., will spend $1,000,000 on plant additions 185 x 360 feet, 70 x 240 feet and 60 x 300 feet.

CHESTER, PA.—The Sun Shipbuilding Co. has let contracts for two new shipways. The cranes are to be furnished by the Pawling & Harnischfeger Co., and the steel by the Belmont Iron Works.

LEISENRING, PA.—The Dupont Powder Co., Wilmington, Del., has let the contract to A. C. Herwick, Connellsville, Pa., for a magazine 20 x 50 feet here.

PHILADELPHIA.—The Standard Tin Foil Corp. contemplates a plant, 2-stories, 130 x 260 feet, to cost $200,000.

PHILADELPHIA.—The General Mfg. Co. contemplates an addition to cost $10,000.

PHILADELPHIA.—The Wicaco Screw Works has awarded contracts for additions.

PHILADELPHIA.—Bids are being received for a building, 3-stories, 116 x 164 feet, for the Enterprise Mfg. Co.

PHILADELPHIA.—The Philadelphia Paper Mfg. Co. contemplates a machine shop, engine room and storeroom, to cost $145,000.

PITTSBURGH.—The Gearless Motor Co. contemplates a plant, 1-story, 32 x 192 feet.

SHARON, PA.—The Carnegie Steel Co., Pittsburgh, has let the contract to the Pennsylvania Engineering Works, New Castle, Pa., for rebuilding one of its blast furnaces here.

SINKING SPRINGS, PA.—The Manufacturers' Foundry Co., James Wotherspoon, in charge, 240 North Front street, Philadelphia, plans a foundry, 30 x 190 feet.

VANDERGRIFT, PA.—The American Sheet & Tin Plate Co. will spend $1,000,000 for additions.

NEWARK, N. J.—A permit has been taken out by the L. E. Waterman Co. for a plant.

NEWARK, N. J.—Adjoining property has been acquired by the Advance Metal Stamping Co. on which it will erect a plant extension.

NEWARK, N. J.—Five and a half acres have been purchased by the Wright Aeronautical Corp. of America, as a site for a plant to be devoted to the manufacture of motors and planes.

BALTIMORE.—The Elgin Mfg. & Plating Co. recently was incorporated with $100,000 capital.

BALTIMORE.—The Baltimore Car Foundry Co., Curtis avenue and Beech street, will build a 1-story addition 90 x 160 to its plant here.

BALTIMORE.—The Champion Motors Corp. has been organized here by capitalists of Philadelphia and Baltimore, with capital of $250,000, and will build an automobile plant in this city.

HAGERSTOWN, MD.—The Crawford Automobile Works will build an addition.

Central States Activity

KENOSHA, WIS.—The Monarch Auto Lock Co. has purchased a site at Winthrop Harbor, a suburb, and will build a machine shop and assembling plant. The cost will be about $75,000 complete.

KENOSHA, WIS.—The capital stock of the Frost Mfg. Co. has been increased from $200,000 to $400,000. The company manufactures brass castings and a general line of brass goods for plumbers and steamfitters. Ground has been broken for two additions, 60 x 75 feet, and further extensions are contemplated.

KEWASKUM, WIS.—The Remmel Mfg. Co. will build an addition, 45 x 122 feet, at a cost of $35,000, including new machinery.

LA CROSSE, WIS.—Organization of the Automotives Foundry Co. has been effected, and the company has purchased a site on which it plans to erect a plant, 100 x 220 feet, to be built at an estimated cost of $75,000. The company is capitalized at $100,000. O. B. Dibble is president.

LA CROSSE, WIS.—A new gray iron and malleable foundry which will specialize in castings for the automobile, truck, tractor and power farm machinery manufacturing trade will be established here in the spring by the Automotive Foundry Corp., incorporated with a capitalization of $100,000 by A. J. Roberg, O. M. Schlabach and C. R. Pieper, all of La Crosse. The new concern has purchased a site and is having plans prepared for a building, 100 x 150 feet, to cost about $50,000.

MELLEN, WIS.—The E. C. Atkins Co., Indianapolis, Ind., has purchased the plant and business of the Pribnow Swage & Tool Works, retaining J. F. Pribnow as manager. New machinery will be installed.

MILWAUKEE.—The Vim Tractor Co. plans an assembly building and machine shop.

MILWAUKEE.—The Geo. J. Meyer Mfg. Co., 576-598 Clinton street, is considering plans for extensive enlargement of its foundry and machine shop.

MILWAUKEE.—The Chain Belt Co., W. C. Frye, president, 736 Park avenue, will build the second unit of its malleable foundry, 150 x 264 feet, costing $150,000.

MILWAUKEE.—The Charles H. Stehling Co., 401 Fourth street, tannery machinery and equipment, has purchased the gray iron foundry at Cedarburg, Wis., from the Western Rope & Mfg. Co. of Oklahoma.

NECEDAH, WIS.—Articles of incorporation have been filed by the Necedah Mfg. Co., capitalized at $100,000. The company is organized under the direction of Fred Lederer of Milwaukee for the purpose of manufacturing automobile accessories. He will act as general manager.

SUPERIOR, WIS.—The Superior Iron Works contemplates a foundry addition.

ANTIGO, MICH.—The Antigo Tractor Co., Charles W. Fish president, recently organized with capitalization of $500,000, will erect a plant for the manufacture of a four-wheel drive truck.

DETROIT.—The Detroit Steel Products Co. plans a plant, 1-story, 126 x 198 feet, to cost $60,000.

DETROIT.—The Hayes Tile Co. plans a machine shop addition at an estimated cost of $25,000, to be 1-story, 26 x 100 feet.

DETROIT.—The Columbia Motors Corp., 1256 East Jefferson avenue, will build a 2 and 3-story plant, 300 x 720 feet, costing $600,000.

DETROIT.—The Clayton & Lambert Mfg. Co., Beaubien street, will build a power plant and a one and 2-story manufacturing plant costing $500,000.

GRAND HAVEN, MICH.—The plant of the Grand Haven Brass Foundry recently was damaged by fire. The loss was estimated at $15,000.

GREENVILLE, MICH.—The Regle Brass Co., recently incorporated with $100,000 capital, will erect a plant, one story, 60 x 200 feet. J. B. Couture is president and general manager.

PETOSKEY, MICH.—The new foundry for the Blackmer Pump Co. is rapidly nearing completion.

SPARTA, MICH.—The Sparta Foundry owned by Elmer Smith, has been purchased by O. French of Grand Rapids, Mich., and will be opened shortly. The plant has been closed for some time.

BLOOMINGTON, ILL.—The Meadows Mfg. Co. has completed the first of a group of buildings. This structure is a foundry building, 90 x 260 feet. The next building will be the core and pattern rooms.

CHICAGO.—The Packard Auto Open Body Co., 10401 Erickson avenue, plans a 3-story plant.

CHICAGO.—The Excel Motor Truck Co. contemplates a plant at an estimated cost of $250,000.

CHICAGO.—The Ilg Electric Co. is erecting a 2-story building at an estimated cost of $300,000.

CHICAGO.—Fred C. Dickow, manufacturer of universal index centers, will build a plant at 3504 West Lake street.

CHICAGO.—Henry Schomer Co., 509 Mather street, manufacturer of spring beds, is building a plant at 1814 South Kilbourne avenue, costing $30,000.

CHICAGO.—The Economy Fuse Mfg. Co. will build

a plant including a 2-story main building 124 x 190 feet, with office building, boiler room and garage, costing $135,000.

CHICAGO.—The Victor Mfg. Co. is erecting a 1-story factory building and a 2-story office building.

HARVEY, ILL.—The Buda Motor Co. has started construction of a 2-story foundry, 140 x 160 feet, to cost $75,000.

JACKSONVILLE, ILL.—The city of Jacksonville will build an addition to its steam power plant costing $40,000. C. M. Borchers is mayor.

PEORIA, ILL.—The Procter hospital will erect a power plant at an estimated cost of $22,000.

ROCK ISLAND, ILL.—The Rock Island Register Co. is having plans drawn for a plant addition, 3-stories, to cost $75,000.

ANDERSON, IND.—The Barber Mfg. Co., whose plant was recently damaged by fire, has purchased the factory of the Spring Steel Fence Co.

COLUMBIA CITY, IND.—The municipal electric light plant will be enlarged. Frank Schultz is city clerk.

EVANSVILLE, IND.—The Evansville Top & Panel Co., a newly organized company, is building a plant here, which is expected to be ready for occupancy about Mar. 1. Oscar E. Ellis is manager.

HAMMOND, IND.—The Railway Motor Car Co. of America will build a power plant, 40 x 70 feet, and a machine shop, 100 x 250 feet. E. Shank, 38 South Dearborn street, Chicago, is architect.

INDIANAPOLIS.—The Vonnegut Machinery Co. will erect a warehouse and salesroom, 95 x 300 feet, to cost $300,000.

MARION, IND.—The Mid-West Foundry Co. has been incorporated with $30,000 capital to engage in a general foundry business. The incorporators are Otto Brunka, Fred Brunka and A. Williams.

MUNCIE, IND.—The Warner Corp., capitalized at $250,000, has been chartered to manufacture automobiles by D. O. Skillen, John F. Warner and Warren M. Sample.

TERRE HAUTE, IND.—The Instant Starter Co., capitalized at $25,000, has been chartered to manufacture starters and other devices by M. W. Haynes, Charles C. Kerlin and Raymond W. Nichols.

AKRON, O.—The Atlantic Foundry Co. contemplates a foundry, 105 x 160 feet, to cost $50,000.

ALLIANCE, O.—The American Steel Foundries has broken ground for an addition to its cleaning building, to be 75 x 250 feet.

BOWLING GREEN, O.—The Universal Machine Co. plans plant additions.

CANTON, O.—The Universal Engineering & Electric Co. has been incorporated with $50,000 capital, by B. H. Greene, L. M. Ripple, D. J. Geisler, H. Steeger and H. E. Black.

CANTON, O.—The American Forge & Machine Co., according to a report, contemplates the enlarging of its plant. Ground has been broken for one new structure, to be 65 x 260 feet.

CINCINNATI.—The Langhaar Ball Bearing Co. has been incorporated with $100,000 capital.

CINCINNATI.—The N. S. Machine Tool Co. has started work on a machine shop, 1-story, 41 x 47 feet.

CINCINNATI.—The Cincinnati Beveling Co. has been incorporated with $5000 capital, by R. L. Brassine, Frank C. Slatz Jr., Sam Krasnitzke and Hilda Held.

CLEVELAND.—The Crucible Steel Forge Co. contemplates a plant.

CLEVELAND.—The Parish-Pool Corp. contemplates a smelting and refining plant.

CLEVELAND.—The New Process Stove Co. contemplates a plant, 3-stories, 55 x 160 feet.

CLEVELAND.—The Reliable Stove Co. is reported planning a plant, 3 stories, 60 x 120 feet, to cost $60,000.

CLEVELAND.—The Champion Machine & Forging Co. has a permit to erect a plant addition one story, 54 x 160 feet, to cost $40,000.

CLEVELAND.—The Cleveland Drop Forge Co. has been incorporated with $750,000 capital, by I. W Sharp, Cuyahoga building, H. S. Brady, S. C. Smith, H. P. Baker and A. Cullen.

CLEVELAND.—The Jewell Brass Mfg. Co. recently was incorporated with $35,000 capital, by Sidney N. Weitz, Engineers building, Marc J. Grossman, Irwin N. Loesser, Harry Pott and Fred B. Fishman.

CLEVELAND.—The Economy Appliance Co. has been incorporated with $30,000 capital, by Samuel I. Rice, O. J. Fulten, Roy N. Shellings, R. G. Schaibly and Fred F. Truhlar, Society for Savings building.

COLUMBIA, O.—The plant of the Columbia Boiler Co. recently was badly damaged by fire. The loss has been estimated at $200,000.

Throughout the West

CLEARWATER, MINN.—Plans are being made for a waterworks plant including steel tank and pumps at a cost of $60,000. The Bradley Engineering Service, St. Cloud, Minn., is engineer.

MINNEAPOLIS.—The Magnet Tractor Co. plans an addition to cost $100,000.

MINNEAPOLIS.—The Mereen Johnson Machine Co. has had plans drawn for the erection of a foundry, 40 x 72 feet.

DES MOINES, IOWA.—The Iowa Steel Mfg. Co. has been incorporated with $250,000 capital, by E. H. Jayne, Charles Spikings and others.

KANSAS CITY, MO.—The Kansas City Structural Steel Co. plans plant extensions which will include a warehouse, 230 x 700 feet.

ST. JOSEPH, MO.—The St. Joseph Structural Steel Co. plans a plant at an estimated cost of $75,000.

ST. LOUIS.—The St. Louis Truck Hardware & Mfg. Co. contemplates an addition, 1-story, 35 x 48 feet.

ST. LOUIS.—The Blackmere & Post Pipe Co. has had plans prepared for a machine shop addition, to cost $10,000.

ST. LOUIS.—The American Range Foundry Co. has purchased a site on which it plans the erection of a modern plant. C. W. Nye is president.

DALLAS, TEX.—The Hayden Spring Wheel Co., capitalized at $400,000, has been chartered to manufacture metal wheels by R. B. Stitcher, B. Cornelison and R. E. L. Saner.

EASTLAND, TEX.—The Howard Tool Works, capitalized at $50,000, has been chartered to manufacture tools by D. M. Howard, H. L. Dulbin and P. S. Wolfe.

FT. WORTH, TEX.—The Ballard-Martin Electric Co. has had plans prepared for a plant for the manufacture of electric equipment at a cost of $100,000.

HOUSTON, TEX.—The city council has appropriated $800,000 for waterworks improvements. David Fitzgerald is city water commissioner.

MINERAL WELLS, TEX.—Hyett & Croft will build a 2-story machine shop, 100 x 200 feet, costing $25,000.

FT. TOWSON, OKLA.—The Butler Locomotive Safety Appliance Co., C. C. Cutler, will equip a plant for the manufacture of special devices at a cost of $50,000.

MADILL, OKLA.—An election will be held Jan. 13 on issuing $350,000 in bonds to enlarge the waterworks system. Johnson & Benham, Kansas City, Mo., are engineers.

TULSA, OKLA.—The Southwestern Light & Power Co., Inc., has been incorporated with $100,000 capital.

TULSA, OKLA.—The Southern Steel Products Co recently was incorporated with $100,000 capital, by Herriett Baber, Trevor Sanks and Paul D. Murrin.

ATCHISON, KANS.—The Bailer Plow Co. contemplates an assembling building, 1-story, 77 x 178 feet, to cost $15,000.

ENTERPRISE, OREG.—An election will be held soon on issuing $120,000 in bonds to enlarge the waterworks system. O. J. Roe is city recorder.

Business in Canada

DESCHENES, QUE.—The British American Nickel Co. is making preparations for extensions and improvements to its plant here.

MONTMAGNY, QUE.—The Agricultural Machinery Co. has let the general contract for a plant addition to cost $30,000.

MONTREAL, QUE.—The John Allen Safe Co., Ltd., has been incorporated to manufacture safes, etc., with $75,000 capital, by John MacNaughton, Robert Dodd, James A. Rose and others.

MONTREAL, QUE.—The Mitchell-Dorset Co., Ltd., has been incorporated to manufacture electrical equipment, etc., with $50,000 capital, by Linton H. Ballantyne, Francis G. Bush, George R. Drennan and others.

MONTREAL, QUE.—The Eriez Stove & Mfg. Co., of Canada, Ltd., has been incorporated to manufacture heating appliances, etc., with $200,000 capital, by Frank B. Common, Francis G. Bush, Herbert W. Jackson and others.

MONTREAL, QUE.—Specialties, Ltd., have been incorporated to manufacture iron, steel, metal products, machinery, tools, etc., with $50,000 capital, by John W. Blair and Francis J. Laverty both of Westmount, Que.; Charles A. Hale, Montreal West, and others.

MONTREAL, QUE.—The Anglo-Canadian Wire Works, Ltd., has let the contract for a factory to cost $50,000.

ST. JOHNS, QUE.—The Canada Hart Accumulator Co. has let the contract for a plant addition to cost $25,000.

BELLEVILLE, ONT.—The Weed Harvester Machine Co., Ltd., has been incorporated to manufacture agricultural machinery, etc., with $50,000 capital, by Ellsworth Masten, James H. E. Vrooman, Burton Asselstine and others.

BELLEVILLE, ONT.—The Tivani Electric Steel Co. will erect a steel plant and construct piers at a cost of $5,000,000. Buildings to be erected will cost $250,000; reduction furnaces and rolling mills to cost $4,000,000 will be installed. Consulting engineers are Hamilton & Hansell, Inc., and H. A. De Fries, Park Row, New York City.

HAMILTON, ONT.—The Bird Machine Co., of Canada, Ltd., has been incorporated to manufacture ma-

(Concluded on page 196)

Iron and Steel Prices

Corrected to Tuesday Noon

Iron Ore

Superior Ores, Per Ton, Lower Lake Ports

Old range Bessemer, 55 iron	$6.45
Mesabi Bessemer, 55 iron	6.20
Old range non-Bess., 51½ iron	5.70
Mesabi non-Bess., 51½ iron	5.55

Manganese Ore

Brazilian, 45 to 50 per cent, c.i.f. Atlantic ports, 60c per unit, nominal.

Indian, 45 to 50 per cent, c.i.f. Atlantic ports, 60c per unit, nominal.

Warehouse Prices

Steel bars, Boston	4.00c
Steel bars, Chicago	3.37c
Steel bars, Cleveland	3.52c
Steel bars, Detroit	3.33c
Steel bars, Philadelphia	3.75c
Steel bars, New York	3.37c to 3.62c
Steel bars, St. Louis	3.44c
Steel bars, Cincinnati	3.58c
Steel bars, St. Paul	3.595c
Steel bars, Buffalo	3.515c
Iron bars, Boston	4.50c
Iron bars, Buffalo	4.25c
Iron bars, Chicago	3.37c
Iron bars, Detroit	3.33c
Iron bars, St. Louis	3.44c
Iron bars, Cincinnati	3.58c
Iron bars, Philadelphia	3.75c
Iron bars, New York	4.00c
Shapes, Chicago	3.47c
Shapes, Detroit	3.43c
Shapes, Boston	4.00c
Shapes, St. Louis	3.54c
Shapes, St. Paul	3.695c
Shapes, New York	3.47c
Shapes, Cleveland	3.62c
Shapes, Philadelphia	3.70c
Shapes, Buffalo	3.46½
Shapes, Cincinnati	3.68c
Plates, Buffalo	3.665c
Plates, Chicago	3.67c
Plates, Detroit	3.63c
Plates, Boston	3.95c
Plates, St. Louis	3.74c
Plates, St. Paul	3.895c
Plates, New York	3.67c
Plates, Cleveland	3.82c
Plates, Philadelphia	3.90c
Plates, Cincinnati	3.80c
No. 10 blue anl. sheets, N. Y.	5.07c to 6.00c
No. 10 blue anl. sheets, Phila.	5.25c
No. 10 blue anl. sheets, Chicago	4.57c to 4.82c
No. 10 blue anl. sheets, Cleveland	4.72c to 4.97c
No. 10 blue anl. sheets, Boston	5.30c
No. 10 blue anl. sheets, Buffalo	4.815c
No. 10 blue anl. sheets, St. L.	4.64c
No. 10 blue anl. sheets, Cincinnati	4.78c
No. 10 blue anl. sheets, St. Paul	4.79c
No. 10 blue anl. sheets, Detroit	4.53c
No. 28 black sheets, Chicago	5.62c to 6.00c
No. 28 black sheets, New York	6.25c to 7.50c
No. 28 black sheets, Phila.	6.50c to 6.50c
No. 28 black sheets, Cleveland	5.52c to 5.77c
No. 28 black sheets, Boston	7.65c
No. 28 black sheets, Cincinnati	4.93c
No. 28 black sheets, Detroit	5.58c
No. 28 black sheets, St. Louis	5.69c
No. 28 black sheets, St. Paul	5.845c
No. 28 black sheets, Buffalo	6.25c
No. 28 galv. sheets, Chicago	6.97c to 7.50c
No. 28 galv. sheets, New York	7.50c to 9.50c
No. 28 galv. sheets, Phila.	7.50c to 10.00c
No. 28 galv. sheets, Boston	9.00c
No. 28 galv. sheets, Cleveland	6.87c to 7.12c
No. 28 galv. sheets, Cincinnati	6.28c
No. 28 galv. sheets, Detroit	6.93c
No. 28 galv. sheets, Buffalo	7.50c
No. 28 galv. sheets, St. Louis	7.04c
Bands, New York	4.22c
Bands, Boston	5.20c
Bands, Detroit	4.03c
Bands, Buffalo	4.315c
Hoops, Buffalo	4.315c
Hoops, Boston	5.45c
Hoops, New York	4.47c
Hoops, Detroit	4.03c
Cold rolled shafting, Buffalo	4.85c
Cold rolled shafting, New York	5.00c
Cold rolled flats, squares and hexagons, New York	5.50c

Sheet Schedule—(Black)

Differentials for gage, per 100 pounds.

No. 30	+20c
No. 29	+10c
No. 28 (carloads)	Base
No. 27	—05c
Nos. 25-26	—10c
Nos. 22-24	—15c
Nos. 17-21	—20c
Nos. 15-16	—25c
Nos. 13-14	—30c
Nos. 10-12	—35c

Standard Sizes

Gages Nos. 12 to 30 inclusive, 24, 26, 28 and 30 inches wide by 72, 84, 96 and 120 inches long. Gages Nos. 14 to 28 in addition to the foregoing, 36 wide by 96 inches and 120 inches long. Extras for width and length to be added.

Galvanized and Long Terne

Differentials for gage, per 100 pounds.

No. 30	+50c
No. 20	+25c
No. 28 (carloads)	Base
No. 27	—15c
Nos. 25-26	—30c
Nos. 22-24	—45c
Nos. 17-21	—60c
Nos. 15-16	—75c
Nos. 12-14	—90c
Nos. 10-11	—1.00

Standard Sizes

Gages Nos. 12 to 30 inc., 24, 26, 28, 30 and 36 in. wide by 72, 84, 96 and 120 in. long. Extras for width and length to be added.

Freight Rates, Pig Iron

Mahoning and Shenango valleys to:	
Cleveland	$1.40
Newark, N. J.	4.80
Boston	5.20
Philadelphia	4.40
Pittsburgh	1.40
St. Louis	4.60
Minneapolis, St. Paul	5.70
Buffalo to:	
Albany, N. Y.	$1.80
New England (rail)	3.90
New York and Brooklyn (rail)	3.90
Virginia furnaces to:	
Philadelphia	$4.10
New England	4.70
Brooklyn, Jersey City, Newark	4.40
Birmingham, Ala., to:	
Boston	$8.00
Cincinnati	3.60
Chicago	5.00
Cleveland	5.00
Louisville, Ky.	3.30
Minneapolis, St. Paul	7.30
New York	7.70
Philadelphia	6.50
Pittsburgh	5.70
Savannah, Ga.	3.40
Chicago to:	
St. Louis	$4.25
Des Moines	3.50
Minneapolis, St. Paul	2.50
Milwaukee	.60
Moline, Ill.	1.40
Omaha	4.50
St. Louis	1.90
Ironton and Jackson, O., to:	
Chicago	$3.80
Cincinnati	1.80
Cleveland	2.40
Detroit	.60
Indianapolis	2.30
Minneapolis, St. Paul	5.70

Freight Rates, Finished Material

Pittsburgh, carloads, per 100 lbs., to:	
New York	27.0 cents
Philadelphia	24.5 cents
Boston	30.0 cents
Buffalo	21.5 cents
Baltimore	23.0 cents
Cleveland	17.0 cents
Cincinnati	23.0 cents
Chicago	27.0 cents
Detroit	23.0 cents
Minneapolis and St. Paul	49.5 cents
Denver	$1.09
St. Louis	33.5 cents
New Orleans	38.5 cents
Birmingham	57.5 cents
Pacific coast (all rail)	1.25
Pacific coast (tin plate)	1.25

Blue Annealed

Differential for gage per 100 pounds

Nos. 8 and heavier	— 5c
Nos. 9 and 10 (carloads)	Base
Nos. 11 and 12	+ 5c
Nos. 13 and 14	+10c
Nos. 15 and 16	+20c

Standard Sizes

Widths—24-26-28-30-36 and 48 inches.
Lengths—72-84-96-120 and 144 inches.
Extras for width and length to be added.

Tubular Goods

Steel Pipe

Pittsburgh basing discounts to jobbers in carloads

STANDARD WEIGHT

Butt Weld	Black	Galv.
⅛, ¼ and ⅜-inch	50½	24
½-inch	54½	40
⅝ to 3-inch	57½	44
Lap Weld		
2-inch	50½	38
2½ to 6-inch	53½	41
7 to 12-inch	50½	37
13 to 14-inch	41	..
15-inch	38½	..
PLUGGED AND REAMED		
Butt Weld		
1 to 3-inch	55½	42
2-inch	48½	36
Lap Weld		
2½ to 6-inch	51½	39
EXTRA STRONG PLAIN ENDS		
Butt Weld		
⅛, ¼ and ⅜-inch	46½	29
½-inch	51½	39
¾ to 1½-inch	55½	43
2 to 3-inch	56½	44
Lap Weld		
2-inch	48½	37
2½ to 4-inch	51½	40
4½ to 6-inch	50½	39
7 to 8-inch	46½	33
9 to 12-inch	41½	28
DOUBLE EXTRA STRONG PLAIN		
Butt Weld		
½-inch	42½	32
¾ to 1½-inch	45½	35
2 to 2½-inch	47½	37
Lap Weld		
2-inch	40½	31
2½ to 4-inch	42½	33
4½ to 6-inch	41½	32
7 to 8-inch	36½	23

Wrought Iron Pipe

Pittsburgh basing discounts to jobbers in carloads

THREADS AND COUPLINGS

Butt Weld	Black	Galv.
⅛-inch	1	+14
¼-inch	24½	+ 2½
⅜-inch	25½	+ 1½
½-inch	29½	11½
¾ to 1½-inch	34½	18½
Lap Weld		
2-inch	28½	14½
2½ to 6-inch	30½	17½
7 to 12-inch	27½	14½
PLUGGED AND REAMED		
Two points less than above		
EXTRA STRONG PLAIN ENDS		
Butt Weld		
⅛, ¼-inch	+21	+36
⅜-inch	23½	6½
½-inch	28½	15½
¾ to 1½-inch	34½	19½
Lap Weld		
2-inch	29½	16½
2½ to 4-inch	31½	19½
4½ to 6-inch	30½	18½
7 and 8-inch	22½	10½
9 and 12-inch	17½	5½
DOUBLE EXTRA STRONG PLAIN ENDS		
Butt Weld	Black	Galv.
½-inch	15½	3½
¾ to 1½-inch	20½	8½
Lap Weld		
2-inch	16½	4½
2½ to 4-inch	18½	9½

Lapweld Boiler Tubes

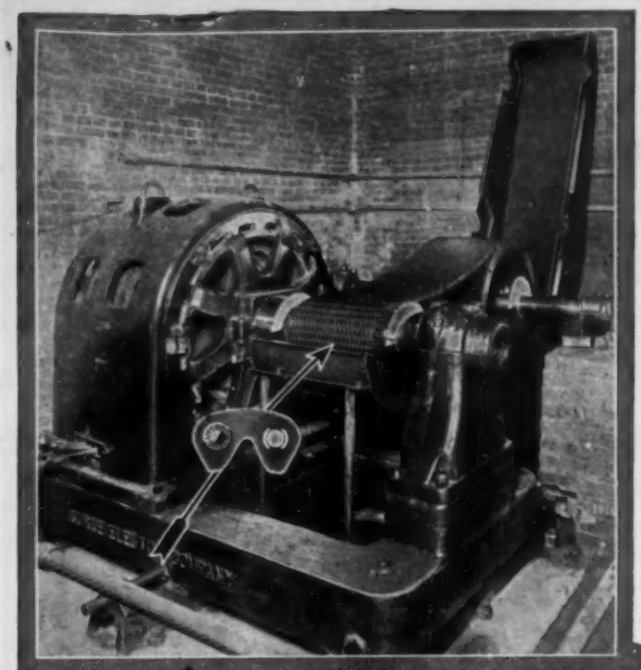
Discounts off manufacturers' standard list, in carloads; less carloads, 4 points less.

Steel

1¾-inch and 2-inch	19
2¼-inch	24
2½ to 3¼-inch	30½
3½ to 4½-inch	40½

Iron

1¾-inch	+20
2 and 2¼-inch	+10
2½ and 2¾-inch	+ 1
3 and 3¼-inch	— 1½
3½ to 4½-inch	—16



Why Link-Belt Silent Chain is the Correct Drive

COULD any other form of power transmission operate with efficiency on the short centers shown in these illustrations? This drive like hundreds of others, is operating almost continuously—it has never been shut down for repairs. The plant in which it is installed depends upon its constant daily performance.

Note the drive is enclosed in the patented Link-Belt oil-tight, dust-proof casing. Lubrication automatically reaches the chain. Safety to employees is assured. And the drive is, like all Link-Belt Silent Chain Drives, 98.2% efficient.

Let us show you where you can use an efficient Link-Belt Silent Chain Drive in your plant.

LINK-BELT COMPANY

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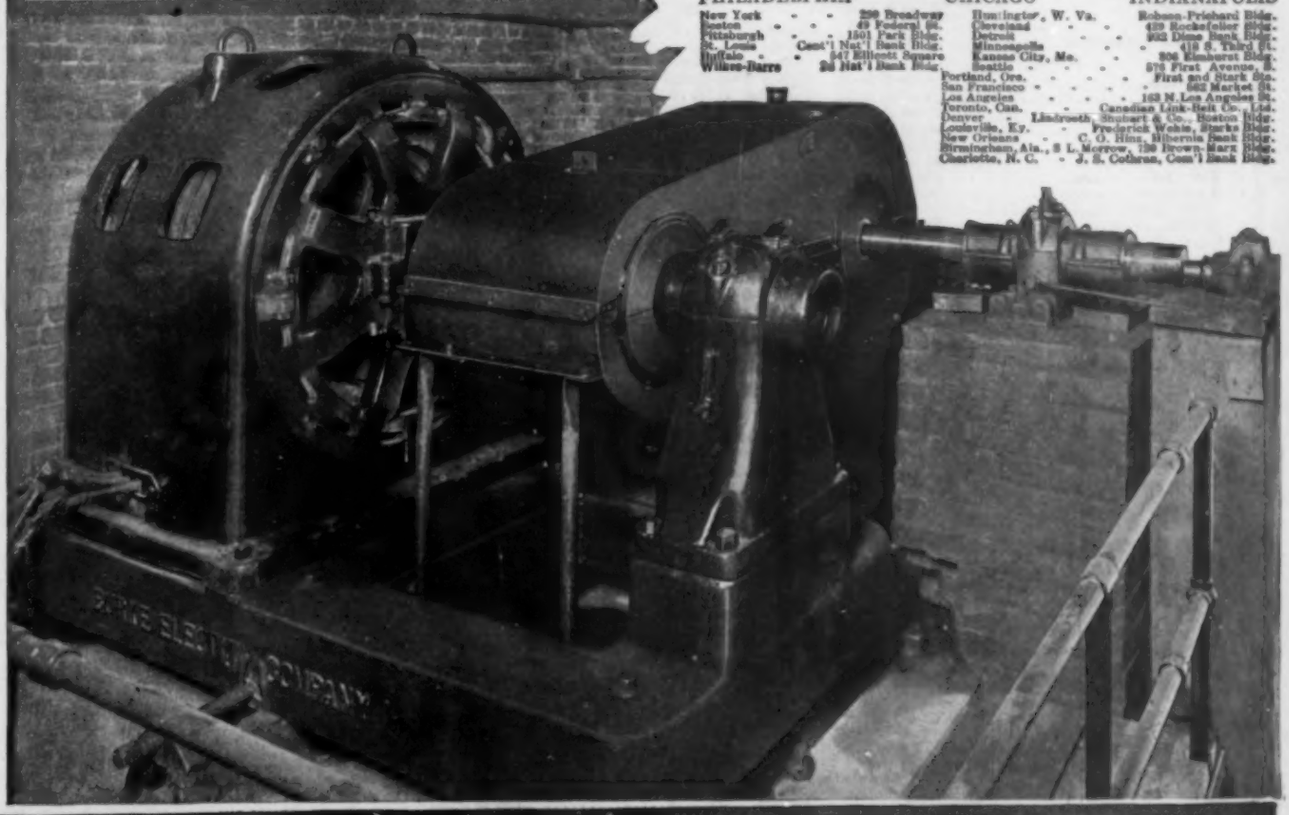
PHILADELPHIA		CHICAGO		INDIANAPOLIS	
New York	299 Broadway	Huntington, W. Va.		Robson-Prichard Bldg.	
Boston	49 Federal St.	Cleveland		429 Rockefeller Bldg.	
Pittsburgh	1501 Park Bldg.	Detroit		902 Dime Bank Bldg.	
St. Louis	Cent'l Nat'l Bank Bldg.	Minneapolis		418 S. Third St.	
Buffalo	947 Ellicott Square	Kansas City, Mo.		906 Elmhurst Bldg.	
Wilkes-Barre	20 Nat'l Bank Bldg.	Seattle		576 First Avenue, S.	
		Portland, Ore.		First and Stark Sts.	
		San Francisco		562 Market St.	
		Los Angeles		163 N. Los Angeles St.	
		Toronto, Can.		Canadian Link-Belt Co., Ltd.	
		Denver	Lindroth, Stubert & Co.,	Boston Bldg.	
		Louisville, Ky.		Frederick Wehle, Starks Bldg.	
		New Orleans		C. O. Hinz, Hibernia Bank Bldg.	
		Birmingham, Ala.,	S. L. Morrow, 120 Brown-Marx Bldg.		
		Charlotte, N. C.		J. S. Cothran, Com'l Bank Bldg.	



We Also Make

- ☐ Elevators and Conveyors
- ☐ Link-Belt and Sprockets
- ☐ Silent Chain Drives
- ☐ Truck and Tractor Chains
- ☐ Electric Hoists
- ☐ Locomotive Cranes
- ☐ Portable Loaders
- ☐ Coal and Ashes Systems
- ☐ Coal Pockets

Write for Catalogs
Place X in Square

LINK-BELT
SILENT CHAIN DRIVES

Iron and Steel Scrap Prices

Corrected to Tuesday Noon

Steel Works Scrap

Gross Tons Delivered to Consumer

HEAVY MELTING STEEL

Pittsburgh	$25.00 to 26.00
Chicago	24.75 to 25.00
Eastern Pennsylvania	23.00 to 24.00
Cleveland	23.50 to 24.00
St. Louis	24.00 to 24.50
Buffalo	23.00 to 23.50
New York (dealers)	19.00 to 19.50
Cincinnati	19.50 to 20.00
Birmingham	22.00 to 23.00
Valleys	24.00 to 24.50
Boston (dealers)	18.50 to 19.00

BUNDLED SHEETS

Pittsburgh	17.50 to 18.00
Eastern Pennsylvania	19.00 to 20.00
Cleveland	16.00 to 16.50
Buffalo	17.00 to 18.00
Cincinnati	14.00 to 15.00
St. Louis	24.00 to 24.50

STEEL RAILS, SHORT

Chicago	$27.50 to 28.00
Boston (dealers)	16.00 to 17.00
Cleveland	22.50 to 23.00
St. Louis	24.50 to 25.00
Birmingham	22.00 to 23.00
Cincinnati	15.50 to 16.00
Eastern Pennsylvania	22.50 to 23.00

STOVE PLATE

Pittsburgh	$23.00 to 24.00
Chicago	33.00 to 33.50
Eastern Pennsylvania	23.00 to 24.50
Cleveland	28.50 to 29.50
St. Louis	29.00 to 29.50
Buffalo	24.00 to 24.50
New York	21.00 to 21.50
Cincinnati	20.00 to 21.00
Birmingham	24.00 to 25.00
Boston	23.50 to 24.50

LOW PHOSPHORUS

Pittsburgh, billet and bloom crops	$30.00 to 31.00
Chicago, billet and bloom crops	24.00 to 25.00
Eastern Penn. (guaranteed)	27.00 to 29.00
Buffalo	27.00 to 28.00

SHOVELING STEEL

Chicago	$24.25 to 24.50
St. Louis	22.00 to 22.50

KNUCKLES, COUPLERS AND SPRINGS

Pittsburgh	$25.50 to 26.50
Chicago	27.50 to 28.00
St. Louis	26.00 to 26.50

BALED SHEETS

Pittsburgh	21.00 to 22.00
Chicago	16.50 to 17.00

FROGS, SWITCHES, GUARDS

Chicago	$24.75 to 25.00
St. Louis	25.00 to 25.50
Eastern Pennsylvania	22.00 to 22.50

BOILER PLATE, CUT

Chicago, No. 1	$19.50 to 20.00
St. Louis	17.00 to 17.50

ANGLE BARS—STEEL

Chicago	$25.50 to 26.00
St. Louis	27.00 to 27.50

Iron Mill Scrap

Gross Tons Delivered to Consumer

RAILROAD WROUGHT

Pittsburgh, No. 1	$27.00 to 28.00
Pittsburgh, No. 2	25.00
Chicago, No. 1	28.00 to 29.00
Chicago, No. 2	25.50 to 26.00
Eastern Pennsylvania, No. 1	32.00 to 33.00
Cleveland, No. 1	24.50 to 25.50
St. Louis, No. 1	25.75 to 26.25
St. Louis, No. 2	24.00 to 24.50
Buffalo	28.00 to 29.00
Cincinnati, No. 1	20.00 to 21.00
Birmingham, No. 1	22.00 to 23.00
New York, No. 1 (dealers)	28.50 to 29.00
Boston (dealers)	26.50 to 27.00

WROUGHT PIPE

Eastern Pennsylvania	$22.00 to 23.00
Eastern Pennsylvania, ungraded	17.00 to 18.00
Buffalo	19.00 to 20.00
New York (dealers)	18.50 to 19.00
Boston (dealers)	18.00 to 18.25

YARD WROUGHT

Eastern Pennsylvania, No. 1	$26.00 to 27.00

CITY WROUGHT

New York, long (dealers)	22.50 to 23.00

BUSHELING

Chicago, No. 1	$24.75 to 25.25
Chicago, No. 2	16.50 to 17.00
Cleveland, No. 1	22.00 to 22.50
Cleveland, No. 2	16.50 to 17.50
St. Louis, No. 1	23.50 to 24.00
Buffalo, No. 1	20.00 to 21.00
Cincinnati, No. 1	20.00 to 20.50
Eastern Pennsylvania, No. 1	20.00 to 21.00

MACHINE SHOP TURNINGS

Pittsburgh	$15.50 to 16.00
Chicago	12.00 to 12.50
Eastern Pennsylvania	18.00 to 18.50
Eastern Pennsylvania (blast furn.)	17.25 to 18.25
Eastern Pennsylvania (chemical)	25.00 to 26.00
Cleveland	14.50 to 15.00
Buffalo	15.00 to 15.50
New York (dealers)	15.00 to 15.50
St. Louis	15.00 to 15.50
Cincinnati	11.50 to 12.00
Birmingham	12.00 to 13.00
Valleys	15.50 to 16.00
Boston (dealers)	13.00 to 14.00
Boston (blast furnace) (dealers)	12.50 to 13.00

CAST IRON BORINGS

Pittsburgh	$18.00 to 19.00
Chicago	15.00 to 15.50
Eastern Pennsylvania	22.00 to 23.00
Eastern Pennsylvania (chemical)	25.00 to 26.00
Cleveland	16.50 to 17.00
St. Louis	13.00 to 13.50
Buffalo	18.00 to 18.50
New York (dealers' price)	17.50 to 18.00
Cincinnati	12.00 to 12.50
Birmingham	12.00 to 13.00
Valleys	18.00 to 18.50
Boston (dealers)	18.00 to 18.50
Boston (blast furnace) (dealers)	12.50 to 13.00

IRON AXLES

Pittsburgh	$44.00 to 45.00
New York (dealers)	48.00 to 50.00
Chicago	39.50 to 40.50
Eastern Pennsylvania	45.00 to 46.00
Cleveland	41.00 to 42.00
St. Louis	38.50 to 39.00
Buffalo	35.00
Cincinnati	29.50 to 30.00
Birmingham	35.00 to 37.00

IRON RAILS

Chicago	29.50 to 30.00
Cleveland	29.50 to 30.50
St. Louis	27.00 to 27.50
Buffalo	28.00 to 29.00
Cincinnati	25.00 to 25.50

PIPES AND FLUES

Chicago	21.50 to 22.00
Cleveland	21.00 to 22.00
St. Louis	20.00 to 20.50
Cincinnati	15.00 to 16.00

GRATE BARS

Chicago	32.50 to 33.00
Cleveland	27.50 to 28.00
Buffalo	24.00 to 25.00
New York	20.00 to 20.50
Eastern Pennsylvania	25.00 to 26.00

FORGE FLASHINGS

Cleveland, large	$18.75 to 19.25
Cleveland, small	20.00 to 21.00
Chicago, small	20.50 to 21.00
Boston (dealers)	13.50 to 14.00

FORGE SCRAP

Chicago	25.50 to 26.00
Eastern Pennsylvania, No. 1	18.00 to 19.00
Boston	14.00 to 14.50

ARCH BARS AND TRANSOMS

Chicago	33.50 to 34.00
St. Louis	32.00 to 32.50

ANGLE BARS—IRON

Chicago	32.00 to 32.50
St. Louis	26.00 to 26.50

Iron and Steel Works Scrap

Gross Tons Delivered to Consumer

AXLE TURNINGS

Pittsburgh	$19.00 to 19.50
Eastern Pennsylvania	19.00 to 20.00
Boston (dealers)	15.00 to 15.50
St. Louis	17.50 to 18.00
Cleveland	19.50 to 20.50
Buffalo	20.00 to 20.50
Chicago	19.50 to 20.00

STEEL CAR AXLES

Pittsburgh	$34.00 to 35.00
Eastern Pennsylvania	35.00 to 36.00
Cleveland	37.50 to 38.50
St. Louis	34.50 to 35.00
Buffalo	35.00
Chicago	33.50 to 34.00
New York (dealers)	40.00 to 41.00
Birmingham	29.00 to 30.00
Boston (dealers)	27.00 to 28.00

SHAFTING

Eastern Pennsylvania	$34.00 to 36.00
St. Louis	32.00 to 32.50
New York (dealers)	28.00 to 29.00
Chicago	30.00 to 30.50

Iron Foundry Scrap

Gross Tons Delivered to Consumer

CAR WHEELS

Pittsburgh, iron	$32.00 to 33.00
Pittsburgh, steel	26.00 to 26.50
Chicago, iron	34.50 to 35.00
Eastern Pennsylvania, iron	33.00 to 35.00
Cleveland, iron	32.00 to 33.00
St. Louis, iron	28.50 to 29.00
Buffalo, iron	32.00 to 33.00
Birmingham, iron	24.00 to 25.00
Birmingham, tram car	24.00 to 25.00
Boston	26.00 to 27.00
Cincinnati	23.00 to 24.00

NO. 1 CAST SCRAP

Pittsburgh, cupola	$31.00 to 32.00
Chicago, cupola	42.00 to 42.50
Eastern Pennsylvania, cupola	33.00 to 35.00
Cleveland, cupola	33.50 to 34.00
New York, cupola (dealers)	33.00 to 34.00
Cincinnati, No. 1, cupola	30.00 to 30.50
Birmingham, cupola	26.00 to 27.00
St. Louis, railroad	32.30 to 33.00
St. Louis, agricultural	32.50 to 33.00
Buffalo	31.00 to 32.00
Boston	36.50 to 37.00
Valleys	33.50 to 34.50

HEAVY CAST

New York (dealers)	29.00 to 30.00
Buffalo	25.00 to 26.00
Pittsburgh	26.00 to 27.00
Cleveland	24.00 to 24.50
Boston	30.00 to 31.00

MALLEABLE

Pittsburgh, railroad	$26.00 to 27.00
Pittsburgh, agricultural	23.00 to 24.00
Chicago, railroad	31.50 to 32.50
Chicago, agricultural	33.00 to 33.50
Eastern Pennsylvania, railroad	25.00 to 27.00
Cleveland, railroad	29.50 to 30.50
Cleveland, agricultural	25.00 to 26.00
St. Louis, railroad	26.00 to 26.50
St. Louis, agricultural	26.00 to 26.50
Cincinnati, railroad	27.00 to 27.50
Cincinnati, agricultural	27.00 to 27.50
Boston, railroad	21.50 to 22.00
Buffalo	25.00 to 26.00

Miscellaneous Scrap

Gross Tons Delivered to Consumer

RE-ROLLING RAILS

5 feet and over

Pittsburgh	$30.00 to 31.00
Chicago	33.00 to 33.50
Eastern Pennsylvania	33.00 to 35.00
Cleveland	33.00 to 34.00
St. Louis	32.00 to 32.50
Birmingham	26.00 to 27.00
Boston (dealers)	27.00 to 28.00

LOCOMOTIVE TIRES

Chicago	27.00 to 28.00
St. Louis	23.00 to 23.50

BOILER PUNCHINGS

Chicago	28.50 to 29.00
Eastern Pennsylvania	27.00 to 28.00

We Buy and Sell

Scrap Iron and Steel
Relaying Rails
Billets for rerolling or forging

Write, phone or see us on your requirements. Let us figure with you when you are in the market to buy or sell.

Millco Service and Prices

Will Please You

The James Miller Company

McCormick Bldg. **CHICAGO**

Say you saw it in THE IRON TRADE REVIEW

New Trade Publications

HOISTS.—Electric hoists, overhead traveling cranes, revolving locomotive cranes, electric telphers, etc., are described and illustrated in a booklet recently published by the Link-Belt Co., Chicago.

THREAD MILLER.—The Smalley General Co., Inc., Bay City, Mich., has published a 4-page folder in which common jobs on a thread miller in the average plant are shown. The drawings are interesting.

LIFT-TRUCKS.—A 4-page folder is being circulated by the Barrett-Cravens Co., Chicago, in which the use of lift-trucks in the core room is described. The folder is entitled, "Scientific Methods in the Core Room."

BOLTS.—The Columbus Bolt Works Co., Columbus, O., has published a large catalog in which bolts, nuts, carriage and automobile forgings are described and illustrated. Complete specifications are given. The miscellaneous information section of the booklet contains some interesting data and tables.

VALVES.—A cloth-bound 156-page catalog has been published by the Nelson Valve Co., Philadelphia, in which bronze, iron and steel valves, gate, globe, check and nonreturn valves are described and illustrated. Complete specifications for the various sizes and types of valves are given and the book is well illustrated.

LABOR-SAVING EQUIPMENT.—A booklet of 108 pages is being circulated by the Link-Belt Co., Chicago, in which freight and package handling machinery and other labor saving devices, such as elevators and conveyors, are described and illustrated. The booklet is profusely illustrated, showing the various uses to which this equipment can be put.

LEAD BURNING.—The Davis-Bournonville Co., Jersey City, N. J., is circulating an 8-page bulletin describing lead burning and its uses in industry. The illustrations show lead burner's outfits, torch, bench control block with needle regulating valves, hose, oxygen cylinder, with special pressure regulator and gage, and city gas connection. Other outfits are shown.

MOTOR-OPERATED BRAKES.—A 4-page folder is being circulated by the Cutler-Hammer Mfg. Co., Milwaukee, in which motor-operated brakes for alternating current service are described and illustrated. Six sizes of these brakes are made for use on 25 or 60 cycle, two or three-phase, 110, 220, 440, or 550 volts. Dimensions of the six sizes are given in the pamphlet.

ROLLING MILL MACHINERY.—The Philadelphia Roll & Machine Co., Philadelphia, has issued a cloth-bound loose leaf catalog in which rolling mill machinery for iron and steel works, as well as equipment for brass, copper and other mills, is described and illustrated. The equipment illustrated includes a 3-high merchant mill roll stand, a 3-high merchant mill with 700-horsepower gear drive, a 2-high reversing mill, belt driven, an asbestos roll press, a 2-high brass roughing and finishing mill, and self-contained cold strip mills, shears, plate straightening machines, mill tables, etc.

WOODWORKER'S VISE.—An illustrated folder is being circulated by the Oliver Machinery Co., Grand Rapids, Mich., in which a woodworking vise is described and illustrated. This vise, according to the folder, can be easily and speedily adjusted to any desired angle by a large hand operated collar and is clamped into any tilted position by a rack bar. All parts are interchangeable. The folder also states that the vise can be set at any point in a 90 degree arc and be rotated and set at any point desired within the complete arc of another circle at right angles with the former, without loosening the work in the jaws.

MAGNETIC SEPARATORS.—The Cutler-Hammer Mfg. Co., Milwaukee, has published a booklet in which magnetic separator pulleys are described and illustrated, and the various plants in which they are now in use. These plants include aluminum casting plants, automobile parts plants, bearing manufacturing plants, coke works, coal mines, foundries, etc. These pulleys consist of a number of steel disks keyed to a shaft, an electromagnetic winding being placed between alternate disks. The magnetizing coils are wound on steel bobbins, which are dowelled to the disks to prevent shifting. The coils are connected in series and terminal wires brought through a hole in the center of the shaft to a pair of collector rings located beyond the edge of the pulley to permit the location of a bearing between the collector rings and the pulleys. Other details are given.

(*Concluded from page* 191)

chinery, etc., with $1000 capital, by James S. Lovell, Ernest H. Stewart, William Bain and others.

HAMILTON, ONT.—The Canadian Foamite Firefoam Co., Ltd., has been incorporated to manufacture fire fighting devices and equipment, with $50,000 capital, by William W. Lindsey, John W. Lindsey and others.

KINCARDINE, ONT.—The town council will make extensions and improvements to its waterworks plant to cost $10,000.

OTTAWA, ONT.—Foundries, Ltd., have been incorporated by Frederick Menagh, Harold E. Morrant, Alfred Blake and others with $24,000 capital.

TORONTO, ONT.—The Dunlop Tire & Rubber Co., Booth avenue, is having plans prepared for additions to cost $20,000.

TORONTO, ONT.—The Canadian Fireclay Products, Ltd., has been incorporated to manufacture brick, etc., with $40,000 capital, by Alfred Power, Samuel M. Mehr, Lionel Davis and others.

TORONTO, ONT.—The Republic Flow Meters Co., of Canada, Ltd., has been incorporated to manufacture measuring devices, etc., with $50,000 capital, by William W. Perry, Charles H. C. Leggott and others.

Business Changes Recently Announced by the Trade

THE general offices of the Hillman interests, comprising the J. H. Hillman & Sons Co., the Hillman Coal & Coke Co., the Hecla Coal & Coke Co., the Thompson Connellsville Coke Co., the Clarksville Gas Coal Co., the Luzerne Coal & Coke Co., the Belle Vernon Coal Co., the West Penn Coke Co., the Hillman Transportation Co. and the Dravosburg Dock & Construction Co., now are concentrated on the twentieth and twenty-first floors of the First National Bank building, Pittsburgh. For the present the offices of the Diamond Coal & Coke Co. will remain in the House building, and the offices of the Unity Supply Co. will remain in the Oliver building.

* * *

The Ross Mfg. Co., 2186 East Sixty-fifth street, Cleveland, manufacturer of emery wheel dressers, has removed to its new plant at 3160 West 106th street, that city.

* * *

The Indiana Die Casting Co., Indianapolis, has changed its name to the National Metal Products Co.

* * *

The Firth-Sterling Steel Co., McKeesport, Pa., will remove its New England headquarters from 35 Oliver street, Boston, where they have been located for a generation, to 85 to 91 West First street, South Boston, where a well stocked warehouse will be maintained subsequent to Feb. 1.

* * *

The Massachusetts Blower Co., Watertown, Mass., recently reopened its Boston office, Kimball building, 18 Tremont street, in charge of A. C. Bartlett.

* * *

The corporate name of the Hammond Malleable Iron Co., Hammond, Ind., was changed on Jan. 1 to the Wanner Malleable Iron Co., without change in officers or management.

* * *

The Van Dorn Girder Plate Co., manufacturer of appliances for railway cars, has removed its general offices from 2325 South Paulina street to 608 South Dearborn street, Chicago.

* * *

The O. S. Flath Co., Inc., Peoples Gas Building, Chicago, has succeeded to the business of the Alger Supply Co.

Iron and Steel Prices

Corrected to Tuesday Noon

Iron Ore

Superior Ores, Per Ton, Lower Lake Ports

Old range Bessemer, 55 iron	$6.45
Mesabi Bessemer, 55 iron	6.20
Old range non-Bess., 51½ iron	5.70
Mesabi non-Bess., 51½ iron	5.55

Manganese Ore

Brazilian, 45 to 50 per cent, c.l.f. Atlantic ports, 60c per unit, nominal.

Indian, 45 to 50 per cent, c.l.f. Atlantic ports, 60c per unit, nominal.

Warehouse Prices

Steel bars, Boston	4.00c
Steel bars, Chicago	3.37c
Steel bars, Cleveland	3.52c
Steel bars, Detroit	3.33c
Steel bars, Philadelphia	3.75c
Steel bars, New York	3.37c to 3.62c
Steel bars, St. Louis	3.44c
Steel bars, Cincinnati	3.58c
Steel bars, St. Paul	3.595c
Steel bars, Buffalo	3.515c
Iron bars, Boston	4.50c
Iron bars, Buffalo	4.25c
Iron bars, Chicago	3.37c
Iron bars, Detroit	3.33c
Iron bars, St. Louis	3.44c
Iron bars, Cincinnati	3.58c
Iron bars, Philadelphia	3.75c
Iron bars, New York	4.00c
Shapes, Chicago	3.47c
Shapes, Detroit	3.43c
Shapes, Boston	4.00c
Shapes, St. Louis	3.54c
Shapes, St. Paul	3.695c
Shapes, New York	3.47c
Shapes, Cleveland	3.62c
Shapes, Philadelphia	3.70c
Shapes, Buffalo	3.46½
Shapes, Cincinnati	3.68c
Plates, Buffalo	3.665c
Plates, Chicago	3.67c
Plates, Detroit	3.63c
Plates, Boston	3.95c
Plates, St. Louis	3.74c
Plates, St. Paul	3.895c
Plates, New York	3.67c
Plates, Cleveland	3.82c
Plates, Philadelphia	3.90c
Plates, Cincinnati	3.80c
No. 10 blue anl. sheets, N. Y.	5.07c to 6.00c
No. 10 blue anl. sheets, Phila.	5.25c
No. 10 blue anl. sheets, Chicago	4.57c to 4.82c
No. 10 blue anl. sheets, Cleveland	4.72c to 4.97c
No. 10 blue anl. sheets, Boston	5.30c
No. 10 blue anl. sheets, Buffalo	4.815c
No. 10 blue anl. sheets, St. L.	4.64c
No. 10 blue anl. sheets, Cincinnati	4.78c
No. 10 blue anl. sheets, St. Paul	4.79c
No. 10 blue anl. sheets, Detroit	4.53c
No. 28 black sheets, Chicago	5.62c to 6.00c
No. 28 black sheets, New York	6.25c to 7.50c
No. 28 black sheets, Phila.	6.50c to 6.59c
No. 28 black sheets, Cleveland	5.52c to 5.77c
No. 28 black sheets, Boston	7.65c
No. 28 black sheets, Cincinnati	4.93c
No. 28 black sheets, Detroit	5.58c
No. 28 black sheets, St. Louis	5.69c
No. 28 black sheets, St. Paul	5.845c
No. 28 black sheets, Buffalo	6.25c
No. 28 galv. sheets, Chicago	6.97c to 7.50c
No. 28 galv. sheets, New York	7.50c to 9.50c
No. 28 galv. sheets, Phila.	7.50c to 10.00c
No. 28 galv. sheets, Boston	9.00c
No. 28 galv. sheets, Cleveland	6.87c to 7.12c
No. 28 galv. sheets, Cincinnati	6.28c
No. 28 galv. sheets, Detroit	6.93c
No. 28 galv. sheets, Buffalo	7.50c
No. 28 galv. sheets, St. Louis	7.04c
Bands, New York	4.22c
Bands, Boston	5.20c
Bands, Detroit	4.03c
Bands, Buffalo	4.315c
Hoops, Buffalo	4.315c
Hoops, Boston	5.45c
Hoops, New York	4.47c
Hoops, Detroit	4.03c
Cold rolled shafting, Buffalo	4.85c
Cold rolled shafting, New York	5.00c
Cold rolled flats, squares and hexagons, New York	5.50c

Sheet Schedule—(Black)

Differentials for gage, per 100 pounds.

No. 30	+20c
No. 29	+10c
No. 28 (carloads)	Base
No. 27	—05c
Nos. 25-26	—10c
Nos. 22-24	—15c
Nos. 17-21	—20c
Nos. 15-16	—25c
Nos. 13-14	—30c
Nos. 10-12	—35c

Standard Sizes

Gages Nos. 12 to 30 inclusive, 24, 26, 28 and 30 inches wide by 72, 84, 96 and 120 inches long. Gages Nos. 14 to 28 in addition to the foregoing, 36 wide by 96 inches and 120 inches long. Extras for width and length to be added.

Galvanized and Long Terne

Differentials for gage, per 100 pounds.

No. 30	+50c
No. 29	+25c
No. 28 (carloads)	Base
No. 27	—15c
Nos. 25-26	—30c
Nos. 22-24	—45c
Nos. 17-21	—60c
Nos. 15-16	—75c
Nos. 12-14	—90c
Nos. 10-11	—1.00

Standard Sizes

Gages Nos. 12 to 30 inc., 24, 26, 28, 30 and 36 in. wide by 72, 84, 96 and 120 in. long. Extras for width and length to be added.

Freight Rates, Pig Iron

Mahoning and Shenango valleys to:	
Cleveland	$1.40
Newark, N. J.	4.80
Boston	5.20
Philadelphia	4.40
Pittsburgh	1.40
St. Louis	4.60
Minneapolis, St. Paul	5.70
Buffalo to:	
Albany, N. Y.	$1.80
New England (rail)	3.90
New York and Brooklyn (rail)	3.90
Virginia furnaces to:	
Philadelphia	$4.10
New England	4.70
Brooklyn, Jersey City, Newark	4.40
Birmingham, Ala., to:	
Boston	$8.00
Cincinnati	3.60
Chicago	5.00
Cleveland	5.00
Louisville, Ky.	3.30
Minneapolis, St. Paul	7.30
New York	7.70
Philadelphia	6.50
Pittsburgh	5.70
Savannah, Ga.	3.40
Chicago to:	
St. Louis	$4.25
Des Moines	3.50
Minneapolis, St. Paul	2.50
Milwaukee	.60
Moline, Ill.	1.40
Omaha	4.50
St. Louis	1.90
Ironton and Jackson, O., to:	
Chicago	$3.80
Cincinnati	1.80
Cleveland	2.40
Detroit	.60
Indianapolis	2.30
Minneapolis, St. Paul	5.70

Freight Rates, Finished Material

Pittsburgh, carloads, per 100 lbs., to:	
New York	27.0 cents
Philadelphia	24.5 cents
Boston	30.0 cents
Buffalo	21.5 cents
Baltimore	23.0 cents
Cleveland	17.0 cents
Cincinnati	23.0 cents
Chicago	27.0 cents
Detroit	23.0 cents
Minneapolis and St. Paul	49.5 cents
Denver	$1.09
St. Louis	33.5 cents
New Orleans	38.5 cents
Birmingham	57.5 cents
Pacific coast (all rail)	1.25
Pacific coast (tin plate)	1.25

Blue Annealed

Differential for gage per 100 pounds

Nos. 8 and heavier	— 5c
Nos. 9 and 10 (carloads)	Base
Nos. 11 and 12	+ 5c
Nos. 13 and 14	+10c
Nos. 15 and 16	+20c

Standard Sizes

Widths—24-26-28-30-36 and 48 inches.
Lengths—72-84-96-120 and 144 inches.
Extras for width and length to be added.

Tubular Goods

Steel Pipe

Pittsburgh basing discounts to jobbers in carloads

STANDARD WEIGHT

Butt Weld

	Black	Galv.
⅛, ¼ and ⅜-inch	50½	24
½-inch	54½	40
¾ to 3-inch	57½	44
Lap Weld		
2-inch	50½	38
2½ to 6-inch	53½	41
7 to 12-inch	50½	37
13 to 14-inch	41	..
15-inch	38½	..

PLUGGED AND REAMED

Butt Weld

1 to 3-inch	53½	42
2-inch	48½	36
Lap Weld		
2½ to 6-inch	51½	39

EXTRA STRONG PLAIN ENDS

Butt Weld

⅛, ¼ and ⅜-inch	46½	29
½-inch	51½	39
¾ to 1½-inch	55½	43
2 to 3-inch	56½	44
Lap Weld		
2-inch	48½	37
2½ to 4-inch	51½	40
4½ to 6-inch	50½	39
7 to 8-inch	46½	33
9 to 12-inch	41½	28

DOUBLE EXTRA STRONG PLAIN

Butt Weld

½-inch	42½	32
¾ to 1½-inch	45½	35
2 to 2½-inch	47½	37
Lap Weld		
2-inch	40½	31
2½ to 4-inch	42½	33
4½ to 6-inch	41½	32
7 to 8-inch	36½	23

Wrought Iron Pipe

Pittsburgh basing discounts to jobbers in carloads

THREADS AND COUPLINGS

Butt Weld

	Black	Galv.
⅛-inch	1	+14
¼-inch	24½	+ 2½
⅜-inch	25½	+ 1½
½-inch	29½	11½
¾ to 1½-inch	34½	18½
Lap Weld		
2-inch	28½	14½
2½ to 6-inch	30½	17½
7 to 12-inch	27½	14½

PLUGGED AND REAMED

Two points less than above

EXTRA STRONG PLAIN ENDS

Butt Weld

⅛, ¼-inch	+21	+36
⅜-inch	23½	6½
½-inch	28½	15½
¾ to 1½-inch	34½	19½
Lap Weld		
2-inch	29½	16½
2½ to 4-inch	31½	19½
4½ to 6-inch	30½	18½
7 and 8-inch	22½	10½
9 and 12-inch	17½	5½

DOUBLE EXTRA STRONG PLAIN ENDS

Butt Weld

	Black	Galv.
½-inch	15½	3½
¾ to 1½-inch	20½	8½
Lap Weld		
2-inch	16½	4½
2½ to 4-inch	18½	9½

Lapweld Boiler Tubes

Discounts off manufacturers' standard list, in carloads; less carloads, 4 points less.

Steel

1¾ and 2-inch	19
2¼-inch	24
2½ to 3¼-inch	30½
3½ to 4½-inch	40½

Iron

1¾-inch	+20
2 and 2¼-inch	+10
2½ and 2¾-inch	+ 1
3 and 3¼-inch	— 1½
3½ to 4½-inch	—16

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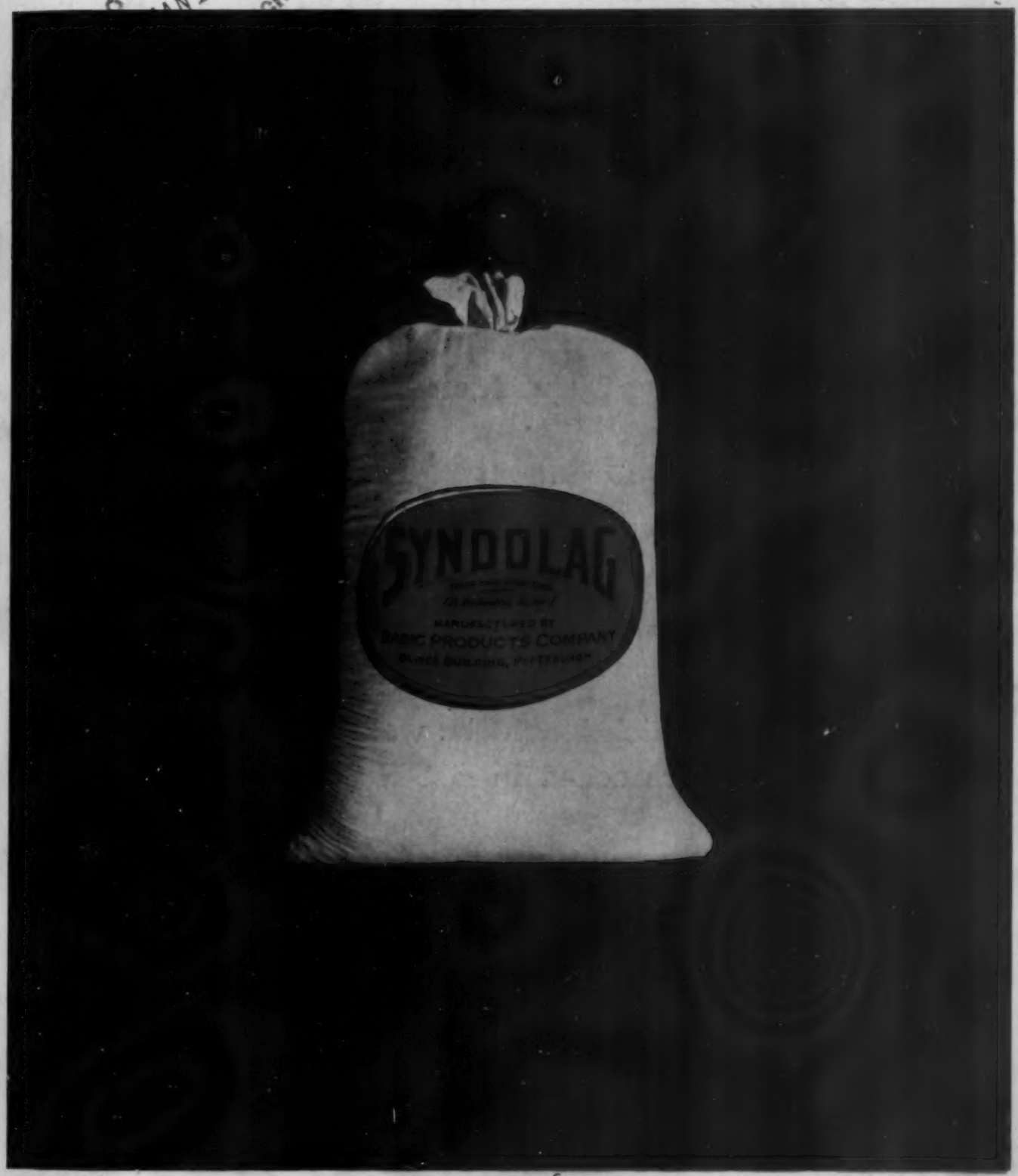

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518 KOPPERS OVENS

were placed in operation in the U. S. last year. Besides having an annual carbonizing capacity of

3,400,000 Net Tons of Coal

These ovens can recover the following by-products each year

40,000,000 Gallons of Tar
44,000 Tons of Ammonium Sulphate
9,500,000 Gallons of Motor Fuel
18,700,000,000 Cu. Ft. of Surplus Gas

all of which would be wasted if the coal were coked in Bee-Hive ovens

THE KOPPERS COMPANY

PITTSBURGH, PA.

Designers and Builders of By-Product Coke and Gas Plants